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Manhattan Garment Center Urban Goods Movement Study. Phase I

New York City Transportation Administration

Prepared for

Urban Mass Transportation Administration
Washington, DC

Jun 76

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Manhattan Garment Center Urban Goods Movement Study

FINAL REPORT

NEW YORK CITY
TRANSPORTATION
ADMINISTRATION

ALEXANDER J. MAUTNER
TRANSPORTATION ADMINISTRATOR

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16. Abstract

The City of New York, with the U.S. Department of Transportation and the U.S. Environmental Protection Agency, has embarked on the Manhattan Garment Center Urban Goods Movement Study in order to better understand the goods movement process, to develop techniques to alleviate the difficulties of urban goods movement, and to implement these techniques. This Garment Center study represents the first major effort to investigate the goods movement problems existing in a major, highly urbanized environment. The project is a comprehensive study of urban goods movement and is organized to meet several objectives: 1) to be accessible and responsive to the community; 2) to develop, design, evaluate, and implement short-term, low capital improvements for the goods movement system; and 3) to identify long-term solutions to goods movement difficulties.

This report presents a summary of Phase I of the Manhattan Garment Center Urban Goods Movement Study. Phase I consists of the development of a data base, analysis of the goods movement problem, and the implementation of short-range proposals to improve the movement of goods and people. It addresses such issues as the economic structure of the garment industry; pattern of land use; volume and patterns of traffic and curbside parking; air and noise pollution levels associated with the garment industry; and the implementation of a program of short-range low capital improvements. This Phase I report states that the analyses, policy recommendations, and experiences of this project are appropriate for a study of urban goods movement in any area, particularly small metropolitan areas.

17. Key Words

Urban Goods Movement
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Inner City
Environment
Air Pollution
Noise
Economics
Traffic
Industry
Pedestrians
Low Capital Improvement

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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
	VOLUME			
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
	TEMPERATURE (exact)			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

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*1 in ≡ 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.

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Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
	TEMPERATURE (exact)			
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

°F
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120
160
200
212
°F
-40
-20
0
20
37
40
60
80
100
°C
°C

1664

NEW YORK CITY
TRANSPORTATION ADMINISTRATION
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In reply refer to:
T-AA3-LP-107.C

Dr. J. Douglas Carroll, Jr.
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Dear Dr. Carroll:

Enclosed herein is the Final Report for Phase I of the Manhattan Garment Center Urban Goods Movement Study.

This Study was performed under agreement number TS-9682 between the Tri-State Regional Planning Commission and the New York City Transportation Administration. Funds were provided by the United States Department of Transportation, United States Environmental Protection Agency and the City of New York. The interest and participation of these Federal agencies and various regional and local agencies provided an important contribution to the Study.

The Garment Center Study is a major pioneering effort in urban goods movement. The efforts of government and industry officials in New York and in other urban areas will be greatly aided by the information contained in this report.

Phase I of the Study was directed towards developing an understanding of the urban goods movement problem in the Garment Center and implementing several short-range low-capital improvements. The goal was to slowly build creditability with the business community by showing that the goods movement problems could be successfully attacked. I am pleased to note that several of the Study's recommendations have been implemented.

Department of Highways Department of Traffic Marine & Aviation Parking Violations Bureau

Phase II of the Study, which is in progress, will take full advantage of the knowledge and government-industry relationship developed during Phase I. One of the major objectives of Phase II is to develop, evaluate and implement several highly significant improvements to the urban goods movement system.

Very truly yours,

a JMautner

Alexander J. Mautner
ADMINISTRATOR

Enclosures

MANHATTAN GARMENT CENTER
URBAN GOODS MOVEMENT STUDY - PHASE I
FINAL REPORT

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CITY OF NEW YORK

ALEXANDER J. MAUTNER, ADMINISTRATOR
TRANSPORTATION ADMINISTRATION

JUNE, 1976
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Table of Contents

Foreword

Chapter I Background

Chapter II Structure of the Study

Project Objectives II-1
Approach to the Study II-2
Organization II-8
Funding II-14

Chapter III Overview of the Garment Center

The Garment Center III-1
The Apparel Industry III-6
The Difficulties Encountered by Goods Movement III-9

Chapter IV Transportation Characteristics

The Apparel Flow Models IV-3
Traffic Characteristics IV-9
Delivery Characteristics IV-19
Trucking Stores IV-24

Chapter V Monetary Costs of Goods Movement

Potential Savings V-6

Chapter VI Public Costs of Goods Movement

Air Quality VI-1
Noise Levels VI-4
Accidents VI-5
Socio Economic................. VI-6

Chapter VII Methodology

District-Wide Traffic Data VII-1
Land-use and Economic Data VII-5
Sample Block Data VII-6
Economic Structure of the Goods Movement System VII-15
Environmental Data VII-17

Chapter VIII Implementation Program

Passenger Vehicle Ban VIII-8
Creation of Turning Lanes VIII-10
Restrictions on Pedestrian Crossings VIII-11
Reductions in Truck Parking Duration VIII-11
Corner Curb Cuts VIII-12
Mid-Block Curb Cuts VIII-13
Implementation Results VIII-14

Chapter IX Phase II Program

Chapter X Summary and Conclusions

General Description X-1
Areas of Improvement X-5
Institutional Framework X-8
Applicability to Other Areas .. X-10
Improvement Programs X-14

Chapter XI Bibliography

Goods Movement XI-1
Garment Center Studies XI-3

Chapter XII Glossary

FOREWARD

The following is the Phase I report of the Manhattan Garment Center Urban Goods Movement Study. Phase I consists of the development of a data base, analysis of the goods movement problem, and implementation of short-range proposals to improve the movement of goods and people. This study was funded by the City of New York, the United States Department of Transportation, the Office of the Assistant Secretary for Policy, Plans and International Affairs, and the Office of the Assistant Secretary for Systems Development and Technology, and the United States Environmental Protection Agency. The DOT-Tri-State contract (DOT-OS-30053) was signed in October of 1972 and announced by Secretary Volpe during a visit to the Garment Center. The agreement between TAD-Tri-State was signed in May of 1973. The project wishes to acknowledge the continuing support and the assistance provided by the numerous agencies and individuals involved. In particular, the help of Dr. Charles Hedges of the United States Department of Transportation and Robert T. Wood of the Tri-State Regional Planning Commission has been invaluable.

The role of urban goods movement in the transportation planning process has not yet been clearly established. There are two divergent schools of thought on this issue. The first would attempt to reduce the economic, environmental, and social costs of the present urban goods movement system. The second school recognizes these costs but states they are the responsibility of private enterprise and beyond the realm of influence of government. One objective of this study has been to show that it is feasible to improve the goods transportation system by the use of existing tools available to government agencies in a cooperative effort with private enterprise.

Work on Phase II of "The Manhattan Garment Center Urban Goods Movement Study" began in September 1975. Phase II will consist of a continuation of certain elements of the Phase I program and will initiate several additional areas of investigation, such as consolidation and parking reservations.

This report presents a summary of Phase I of the Manhattan Garment Center Urban Goods Movement Study. The conclusions presented here are based upon the data and analyses conducted during Phase I. A more detailed description of the activities and analyses on which this report is based is provided in the separate volumes titled Manhattan Garment Center Urban Goods Movement Study, Phase I - Appendix - Volume I, Volume II and Volume III.

I. Background

Urban Goods Movement, the process of moving goods between suppliers, retailers, and consumers in an urban setting, is beginning to be recognized as a serious issue. Goods movement is essential to the economy; the highly specialized structure of the United States economy necessitates large flows of materials and goods between producers, distributors, and consumers. Although goods movement is essential to the economy, the important problems of goods movement have not received adequate attention. In particular, the portion of goods movement occurring within urbanized areas has been neglected. The difficulties of goods movement include relatively high costs of operation, slow travel speeds, low load factors, and inefficiencies in fuel consumption. The City of New York, with the United States Department of Transportation, USDOT, and the United States Environmental Protection Agency, USEPA, has embarked on "The Manhattan Garment Center Urban Goods Movement Study" in order to better understand the goods movement process, to develop techniques to alleviate the difficulties of urban goods movement and to implement these techniques.

Urban Goods Movement is a complex and costly process. Urban commodity flows consist of movements between urbanized areas, within urban areas, and transfers between external and internal activities. Commodities flow between cities via several modes such as trucks, rail, plane, water, and pipeline; however, within urban areas, goods move predominantly by truck.

Transportation costs are a significant portion of the cost of delivering goods to customers. The nation's transportation expenditures totalled approximately $181 billion in 1970. A disproportionate amount of these expenditures arise within the urban segments of trips. Although local trucking represents only 4% of the total ton-miles travelled, it accounts for approximately 30% of the transportation bill. The annual cost of urban goods movement per urban resident is about $430.(1)

The high cost of intraurban goods movement has been attributed to a number of conditions. Average truck speeds are slow; almost 7 m.p.h. in Manhattan.(2) Load factors per vehicle are low; a study of trucking in Columbus, Ohio, indicated that more than 80% of the trucks surveyed were partially loaded.(3) Shipment sizes are also small, necessitating frequent handling. A study of shipments in downtown Brooklyn, New York revealed that the average weight of inbound consignments was 170 lbs., while for outbound consignments the average weight was 154 lbs. In contrast, over-the-road shipments in the area averaged 13,429 lbs. and 23,833 lbs., respectively.(4) The net impact of all these factors is to render urban trucking very costly.

It is estimated that from ½ to 2/3 of the costs of small shipments from New York to Los Angeles arise from the urban portions of the trip.(5)

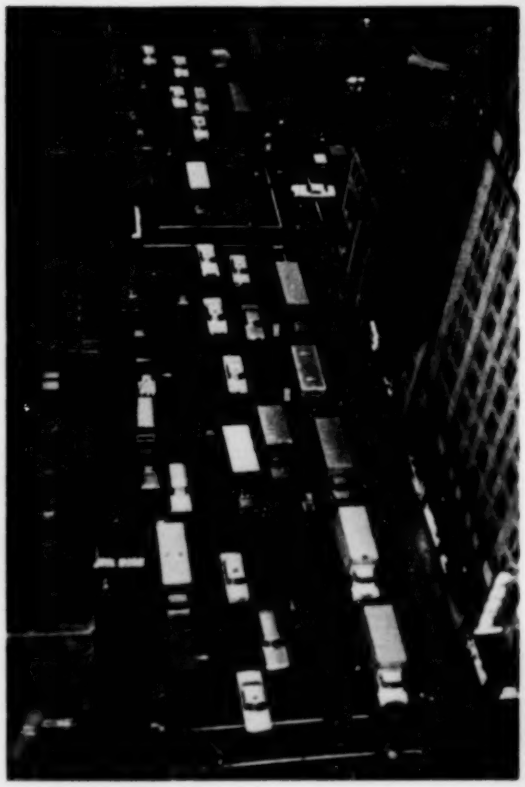
In addition to these direct costs, urban goods movement impinges on other segments of society via hidden costs that are not usually directly attributed to the goods movement. Trucks traveling on city streets are major contributors to pedestrian and vehicular conflicts and to air and noise pollution. This present study estimated that a typical truck presently emits almost four times more carbon monoxide per mile traveled than either an automobile, taxi, or bus. Similarly, trucks contribute a more than proportionate share to the general noise level. The resultant delays, poor health, and loss of hearing that arise from the goods movement system are additional costs borne by society at large, but whose magnitude is not well defined.

With the increased emphasis on energy conservation, the impact of urban movement on fuel consumption has gained added importance. A superficial analysis of Faucett data suggests that local trucking accounts for at least 30% of the gasoline used for total commercial trucking, 5% of the diesel fuel and 18% of the other uses of petroleum products, e.g. lubricants.(6) This present study estimated that the typical truck operating in the Garment Center averages only 4 miles to the gallon. Improvements in fossil fuels economies are clearly possible.

The Transportation Administration of the City of New York embarked on a study of urban goods movement to achieve a better understanding of the intraurban flow of goods and to develop alternatives which would yield greater transportation efficiencies while reducing the negative environmental effect of the goods movement process, including conflicts between people and goods movement. The Garment Center's apparel industry was selected for study because of its importance to the city's economy, the declining employment in the industry, due to the out-migration of firms, the importance of transportation to its efficient operations, and its concentration within a limited geographic setting. The spatial compactness of the industry makes problem identification, program implementation and monitoring relatively easier.

The apparel industry, New York area's largest employer of blue-collar workers, is the largest manufacturing industry in the city and in the state. This industry employed 123,000 people in the New York Metropolitan Region during 1972; 88,000 in New York City itself. By comparison, 140,000 workers were employed by the industry in New York City in 1947. It is a primary employer of minorities and approximately 65% of its workers are women. Although the

Large pedestrian volumes on Garment Center streets



Bird's eye view of Garment Center vehicular activity

Conflicts between pedestrian and handcart activity

GARMENT CENTER ACTIVITY LEVELS

apparel industry requires specialized talents of financial experts, corporate managers and internationally known designers, most of the jobs can be classified as low and semi-skilled. Thus the industry provides employment opportunities for New York area residents with limited job possibilities. It is, therefore, one of the cornerstones of the City's economic base.

The heart of apparel-related activity is Manhattan's Garment Center, a 40 square block area located between Fifth and Tenth Avenues and West 34th and West 42nd Streets. The marketing characteristics of the industry encourage the location of thousands of small apparel firms in this small area. These firms employed 50,000 people during 1973, with an additional 20,000 employed by the many associated service industries, such as trucking. The large number of workers and the high volumes of goods flowing into and out of the area result in high levels of pedestrian and trucking activities.

Within the area, trucking activity is very concentrated and intense, probably greater than anywhere else in the nation. The substantial level of traffic congestion is an important constraint in the industry's operations. The high concentration of firms, as well as the industry's operating characteristics, are major contributors to the congestion.

As a result of the importance of the industry to the area and as a result of the importance of urban goods movement, the New York City Transportation Administration (TAD) is sponsoring "The Manhattan Garment Center Urban Goods Movement Study." Funds are provided by the City of New York, the United States Department of Transportation (USDOT), and the United States Environmental Protection Agency (USEPA). The project is administered locally by the Tri-State Regional Planning Commission. Federal coordination for the study is in the Office of the Secretary, United States Department of Transportation.

Thus, "The Manhattan Garment Center Urban Goods Movement Study" is an attempt by the City of New York to address the broad and vital problems generated by urban goods movement. The work is an in-depth study of the characteristics of the urban goods movement process in a specific area with the goal of the development and implementation of techniques to alleviate goods movement difficulties. Such topics as apparel firm characteristics, transportation characteristics, monetary costs of goods movement, public costs of goods movement, will be discussed. It is hoped that this study will be of aid to other areas, facing the problems of urban goods movement.

CHAPTER I - FOOTNOTES

1. U.S. Department of Transportation 1972 National Transportation Report, Present Status-Future Alternatives. Washington, D.C. 1972, p.15.

2. Weeden and Company, Manhattan Auto Study, New York, 1971, p. I-5.

3. Dennis R. McDermott and James F. Robeson, The Role of Terminal Consolidation in Urban Goods Distribution, Paper presented at the 53rd Annual Meeting, Highway Research Board, January 1974.

4. Robert T. Wood, "Structure and Economics of Intraurban Goods Movement" in Urban Commodity Flow, Special Report 120, Highway Research Board, Washington, D.C., December 1971, p.31

5. Vreeland, B. The Shipper, Paper presented at The Metropolitan Goods Movement Symposium, The Department of Transportation Planning and Engineering of the Polytechnic Institute of Brooklyn, New York City, March 1972.

6. Jack Faucett Associates, Energy Consumption By Mode, Report prepared for The Office of the Secretary, U.S. Department of Transportation, May, 1973. Table 3, p. 15. It was assumed that 50% of the gasoline and residual petroleum products used by for-hire trucking represented local freight activity.

II. Structure of the Study

This chapter describes the organizational structure of the study, the staff assigned to the project and the sources of funding. The work program tasks and their time frames are discussed, as is the approach to the study.

II.1 Project Objectives

This technical project's primary aim is to develop practical ways to improve the movement of people and goods in the Garment Center. The specific objectives of the project are:

1. To develop, design, and evaluate short-term, low-capital improvements for the urban goods movement system within the Garment Center.
2. To identify long-term solutions to the goods movement problems within the Garment Center.
3. To achieve and maintain proper coordination and participation of all the industry, management, union, planning, and government groups associated with the study.
4. To determine the impact of the goods movement system on air and noise quality in the Garment Center. To assess the impact that proposed improvements to the goods movement system will have on air quality.
5. To determine the economic and institutional structure of the goods movement system in the Garment Center.
6. To reduce conflicts between goods and person transportation.
7. To assess the general applicability of the study's findings to other urban areas.

To achieve the objectives of the project, tasks were divided into several phases. Under Phase I, tasks included development of a data base, evaluation of short-range, low-capital cost improvements, and identification of potential long-term solutions. Implementation was emphasized. Phase II will continue certain elements of the Phase I program and initiate several additional areas of investigation. Some of the tasks to be performed include the development of additional short-range proposals, the development of long-range proposals, the development of a transportation activity model, a freight rates study, and the monitoring of Phase I implementations. These areas, which are more significant from the goods movement perspective, could not have been undertaken earlier because of the need to establish a data base.

II.2 Approach to the Study

To achieve the study's Phase I goals, a broad approach was formulated. There would be wide participation of diverse groups. The apparel and trucking industries, real estate interests, various agencies of New York City and federal agencies were represented to facilitate the development and implementation of Phase I goals. More specifically, a work program, consisting of five primary task elements, was developed:

1. Data Collection
2. Data Analysis
3. Immediate Action Program
4. Long Range Alternatives

5. Report Writing

During the data collection phase of the study, information concerning the activities of the Garment Center was gathered. Detailed data on vehicular volumes, traffic characteristics, street activity, building activity, sidewalk activity, land use, and economic data were compiled. In addition, environmental data, including air pollution and ambient noise levels, were collected. The diversified data collected provided insights into the types of movements in the area, the area's organization in terms of land use and employment, the location of concentrations of activity, the environmental conditions in the Garment Center, and the operation of the goods movement system.

Data were collected on a district-wide basis and on four sample blocks in the Core of the Garment Center. Data acquisition employed standard engineering techniques, i.e., manual and machine counts of vehicular volumes, as well as, questionnaires and time-lapse photography. These surveys indicated the frequencies and time lengths of the components of the goods movement process. The questionnaires were designed to obtain an overview of the operational structure of the apparel and trucking industries as well as providing insights into the several stages of the transportation flows.

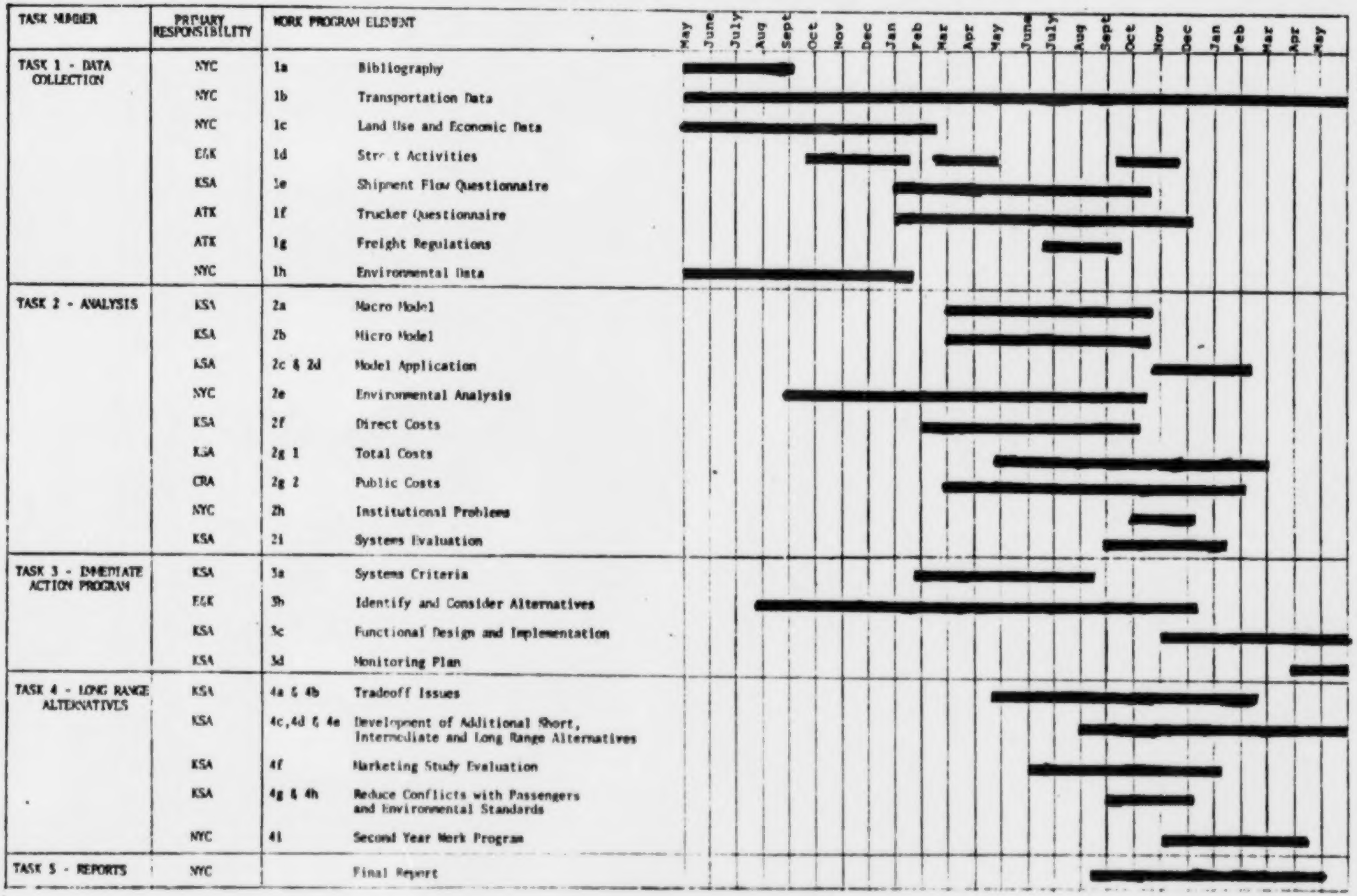
The data analysis portion of the study utilized the comprehensive and detailed data base gathered by the study staff. Among the major results of the analysis effort were the identification of major critical points in the goods movement system (see Chapter IV), the establishment of the cost of goods movement to various segments of the population, (see Chapter V), the assessment of the environmental conditions in the district and their relation to goods movement and to the National Ambient Air Quality Standards, (see Chapter VI), and the development of micro-scale and macro-scale models of goods flow, (see Chapter IV). Further from the analytical approaches used, the interactions between land use, the trucking and apparel industries, and the environment were synthesized. The analysis portion of the total effort also provided some simple tools that facilitated the evaluation of a number of programs proposed for implementation.

The implementation of a program of short-range low-capital improvements is a major goal of this study. In order to develop such a program, the staff identified numerous possible improvements to the goods movement system. These potential improvements were developed from a review of the current activity in the goods movement field, a compilation of suggestions from the industry, and the analysis of the data collected. From the numerous possible options proposed,

Figure II-1

MANHATTAN GARMENT CENTER URBAN GOODS MOVEMENT STUDY

COMPLETED WORK PROGRAM BY TASK (May 1973 to May 1975)



TASK NUMBER	PRIMARY RESPONSIBILITY	WORK PROGRAM ELEMENT	
TASK 1 - DATA COLLECTION	NYC	1a	Bibliography
	NYC	1b	Transportation Data
	NYC	1c	Land Use and Economic Data
	E&K	1d	Street Activities
	KSA	1e	Shipment Flow Questionnaire
	ATK	1f	Trucker Questionnaire
	ATK	1g	Freight Regulations
	NYC	1h	Environmental Data
TASK 2 - ANALYSIS	KSA	2a	Macro Model
	KSA	2b	Micro Model
	KSA	2c & 2d	Model Application
	NYC	2e	Environmental Analysis
	KSA	2f	Direct Costs
	KSA	2g 1	Total Costs
	CRA	2g 2	Public Costs
	NYC	2h	Institutional Problems
	KSA	2i	Systems Evaluation
TASK 3 - IMMEDIATE ACTION PROGRAM	KSA	3a	Systems Criteria
	E&K	3b	Identify and Consider Alternatives
	KSA	3c	Functional Design and Implementation
	KSA	3d	Monitoring Plan
TASK 4 - LONG RANGE ALTERNATIVES	KSA	4a & 4b	Tradeoff Issues
	KSA	4c,4d & 4e	Development of Additional Short, Intermediate and Long Range Alternatives
	KSA	4f	Marketing Study Evaluation
	KSA	4g & 4h	Reduce Conflicts with Passengers and Environmental Standards
	NYC	4i	Second Year Work Program
TASK 5 - REPORTS	NYC		Final Report

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several were selected for implementation (see Chapter VIII). Before and after monitoring of the different elements of test programs will be carried out during Phase II.

Finally, a number of long-range alternatives have been identified as possible means of improving goods movement in the Garment Center. These proposals will require further study during Phase II of the project. (see Chapter IX). A more intensive investigation of these long-range alternatives is required as they involve either high capital investments, major operational changes, or technological innovations.

Figure II-1 lists each of the task elements performed, the agency with prime responsibility for task completion, and the time for each task. In addition to New York City personnel, consultants were utilized in Phase I. The agents with task responsibility include Kurt Salmon Associates, (KSA), apparel management consultants; Edwards and Kelcey (E&K), traffic engineers; A.T. Kearney (ATK), trucking management consultants; Charles River Associates, (CRA), economic consultants; and various agencies of the City of New York, (NYC).

The Manhattan Garment Center Urban Goods Movement Study- Phase I was originally planned to last one year. The DOT-Tri-State contract (DOT-0s-30053) was signed in October of 1972. The agreement between TAD-Tri-State was signed May of 1973. The contracts engaging the consultants were all executed by October 1, 1973; a year after the DOT-Tri-State contract. Thus, the signing of all the contracts imposed a delay of approximately one year.

Once under way, the project experienced other delays. The data collection phase consisted of gathering detailed data on such diversified items as traffic volumes and characteristics, street activity, Garment Center firm characteristics, economic and environmental data. These activities often took longer then scheduled. As one example, there were meetings that had to be arranged with the various trade associations to gain access to individuals who would supply the project staff with needed information. Once this was accomplished, face-to-face interviews had to be conducted. Although fact-to-face interviews require coordination and more time than other techniques, the rate of response is higher than mailed questionnaires.

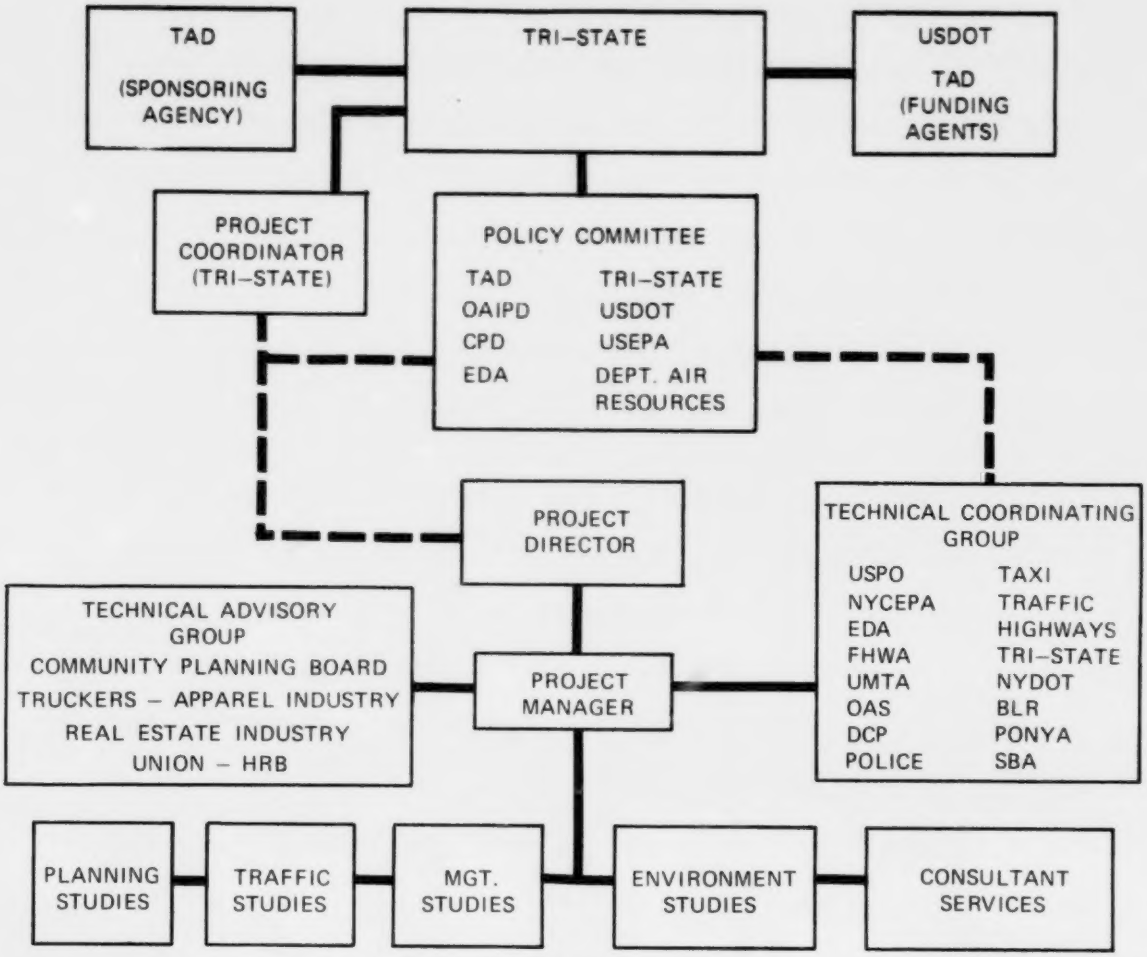
Considerable time was spent in the development of proposed improvements. The reaction and feedback of the various groups were necessary. Meetings were arranged with all the groups and with the three committees organized for the study. In addition, meetings were held with smaller groups and individuals to facilitate the required communications needed for the study's progress. Part of the difficulty was that so many groups, e.g., the garment industry, the trucking industry, the different levels of governmental agencies, were involved. Thus, all the diversified interest groups with their different perspectives and needs had to be involved.

II.3 Organization

The Garment Center Study represents the first major effort to investigate the goods movement problems existing in a major, highly urbanized environment. Although several studies have been conducted in the area, most have focused their effort upon traffic problems. (see Chapter XI). In contrast to these earlier efforts, this study deals with the issues related to the entire goods movement process. As one of the first comprehensive studies of urban goods movement, the project was organized to meet several objectives. First, the project was to be highly accessible and responsive to the community. Second, the goal of the project was to develop, design, evaluate, and implement short-term, low capital improvement for the urban goods

Figure II-2

MANHATTAN GARMENT CENTER GOODS MOVEMENT STUDY
PROJECT ORGANIZATION


TAD (SPONSORING AGENCY)
TRI-STATE
USDOT TAD (FUNDING AGENTS)
PROJECT COORDINATOR (TRI-STATE)
POLICY COMMITTEE
TAD
TRI-STATE
OAIPD
USDOT
CPD
USEPA
EDA
DEPT. AIR RESOURCES
PROJECT DIRECTOR
TECHNICAL COORDINATING GROUP
USPO
TAXI
NYCEPA
TRAFFIC
EDA
HIGHWAYS
FHWA
TRI-STATE
UMTA
NYDOT
OAS
BLR
DCP
PONYA
POLICE
SBA
TECHNICAL ADVISORY GROUP
COMMUNITY PLANNING BOARD
TRUCKERS – APPAREL INDUSTRY
REAL ESTATE INDUSTRY
UNION – HRB
PROJECT MANAGER
PLANNING STUDIES
TRAFFIC STUDIES
MGT. STUDIES
ENVIRONMENT STUDIES
CONSULTANT SERVICES

Code to Abbreviations:

USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
FHWA	United States Federal Highway Administration
UMTA	United States Urban Mass Transportation Administration
OAS	United States Department of Transportation-Office Asst. Secretary
BLR	United States Department of Labor, Bur. of Labor Statistics
SBA	United States Small Business Administration
NYCTAD	New York City Transportation Administration
Traffic	New York City Traffic Department
Highways	New York City Highway Department
OAIPD	Office of Apparel Industry Planning and Development
CPD	Department of City Planning - NYC
EDA	Economic Development Administration - NYC
NYCEPA	New York City Environmental Protection Administration
PONYA	Port Authority of New York and New Jersey
USPO	United States Post Office
TAXI	Taxi and Limousine Commission – NYC
NYDOT	New York State Department of Transportation

movement system. Third, the project was to identify long-term solutions to goods movement difficulties.

The committee structure shown in Figure II-2 and described below was developed as a means of informing all interested parties as to the progress of the study and to obtain their fullest participation and feedback. Three committees were organized:

1. The Policy Committee
2. The Technical Coordinating Group
3. The Technical Advisory Group

The Policy Committee was created to advise and guide the staff throughout the study. The committee is composed of experienced and knowledgeable representatives of city, state, and federal agencies and is responsible for guiding the project's course. The Committee members represent the eight public agencies involved in the project. These agencies are the Transportation Administration (TAD), The Mayor's Office of Apparel Industry Planning and Development (OAIPD), the City Planning Department (CPD), the Economic Development Administration (EDA), New York City Department of Air Resources (DAR), the Tri-State Regional Planning Commission (Tri-State), United States Department of Transportation (USDOT), and the United States Environmental Protection Administration (USEPA). The Committee has played a significant role during the key policy decision-making phases of the project.

The Technical Coordinating Group is composed of representatives from major city, state, and federal agencies. The committee provides an input from different public sector groups with their own special interests, e.g., environmental, law enforcement, economic development, transportation, etc. This committee also facilitated the dissemination of relevant information on this study. The participants' comments and criticisms, reflecting their particular expertise, were an important element in the total effort.

The Technical Advisory Group was the third and final committee created. This committee consists of members of the private sector, including representatives of the apparel, trucking and real estate industries, and labor unions. These private sector groups had made a strong commitment at the project's inception to cooperate with and participate in the study. This committee serves as one means for assuring that continuous communications between the study staff and the private sector is maintained.

These committees provided a forum where issues important to private industry and local community groups, and local, state and federal agencies were addressed. Meetings held with the various groups helped the project to focus on and to study the specific concerns of each group.

The trucking industry expressed its concern at the inadequate parking and loading/unlaoding space, the low travel speeds, long delivery times and elevator queues. The unions voiced their concern about providing jobs and maintaining their members' standard of living. The real estate interests are concerned about maintaining the vitality of the area and improving its ambiance. Areas of concern for local and regional governmental groups include maintenance of the apparel industry in New York because of its importance to the local economy; the level of vehicular congestion in the area, which affects through and garment-related traffic; the air and noise pollution levels in the area which do not meet federally mandated standards. Thus, all the diversified interest groups are concerned in various degrees and from different perspectives with the numerous problems facing the Garment Center. The existence and interrelationships of these problems were crystalized, partly through committee meetings.

In addition, these committees provided an opportunity for the various groups to voice their objections or support in the various proposed improvements. The solutions proposed or desired by these different groups may compete or negate one another.

The different interests of the various groups create conflicts which make implementation difficult. The committee structure provided an opportunity to identify and address these conflicts.

The three standing committees provided guidance and assistance to the staff assigned to the project. In addition, the Transportation Administration staff was ably assisted by other city agencies (Office of Apparel Industry Planning and Development, Department of Air Resources, Economic Development Administration, City Planning Department and New York City Police Department) and the four consultants (Edwards and Kelcey, Kurt Salmon Associates, Charles River Associates, and A.T. Kearney). Together all these diversified groups have been responsible for fulfilling the duties stipulated in the original contract agreement. The consultants were called upon to provide the expertise and analytical sophistication required to support and advise the TAD staff. The TAD staff, which included economists, physical distribution experts, transportation engineers, urban planners, and urban designers, coordinated as well as directed the various groups toward the completion of the work program.

II.4 Funding

In accordance with the DOT-Tri-State contract, USDOT and USEPA provided $133,333 during Phase I. TAD was required to provide one-third matching funds, $66,667. As a result and because of their interest and commitment, The City of New York and its constituent agencies have provided a local contribution significantly in excess of the one-third matching share stipulated in the original agreement.

The funds provided by the Federal contract were utilized primarily for consultants in four different areas of specialization. The consultant staff is composed of: Kurt Salmon Associates, (apparel management consultants at $57,000); Edwards and Kelcey.(traffic engineers at $39,000); A.T. Kearney, (trucking management consultants at $12,000); and Charles River Associates, (economic consultants at $7,000). The contracts engaging these consultants were all executed by October 1, 1973.

In summary, the data acquisition phase of the study provided the basis for a careful and detailed analysis of the interrelated conditions in the Garment Center. The analysis phase identified the problem areas in the district and provided the means for analyzing the alternatives proposed for solving the problems. The implementation of a number of short-range proposals will test the susceptibility of some problems to improvement. This then leads to the long-range proposals involving alternatives that could result in major improvements as a result of changes in the operation of the goods movement system. At each stage of the study, there was interaction, and feedback between the various groups, consultants, the three committees, TAD staff, and other cooperating governmental agencies to insure the study's viability.

III. Overview of the Garment Center

The operation of the urban goods movement process is determined by the characteristics of the industries served and the areas in which these activities occur. The conflict and congestion occurring within the Garment Center are due to three major factors. They are (a) the area's location, (b) its physical makeup, and (c) the characteristics of the apparel industry and its concentration in a small area. This chapter will describe the level of Garment Center employment, the characteristics of apparel production and flows, and land-use in the district. The impact of these factors upon the goods movement process will be assessed.

III.1 The Garment Center

The underlying theme that explains much of what happens in the Garment Center and other urban manufacturing centers is that they are large groupings of many small businesses. The external economies provided by concentration enable these small firms to exist. The firms are small so as to maintain necessary flexibility enabling them to quickly respond to constantly changing conditions. Efficiency is often sacrificed to maintain flexibility.

The women's apparel industry is a manufacturing activity located in an urban center. Each season thousands of styles are produced on a limited scale; the successful styles will be produced in volume and the unsuccessful ones will be discontinued. The products must be manufactured in volume and shipped to stores as early as possible in the buying season. This demand for speed and flexibility is the context in which Garment Center activities

Figure III-1 THE NEW YORK REGION AND THE GARMENT CENTER

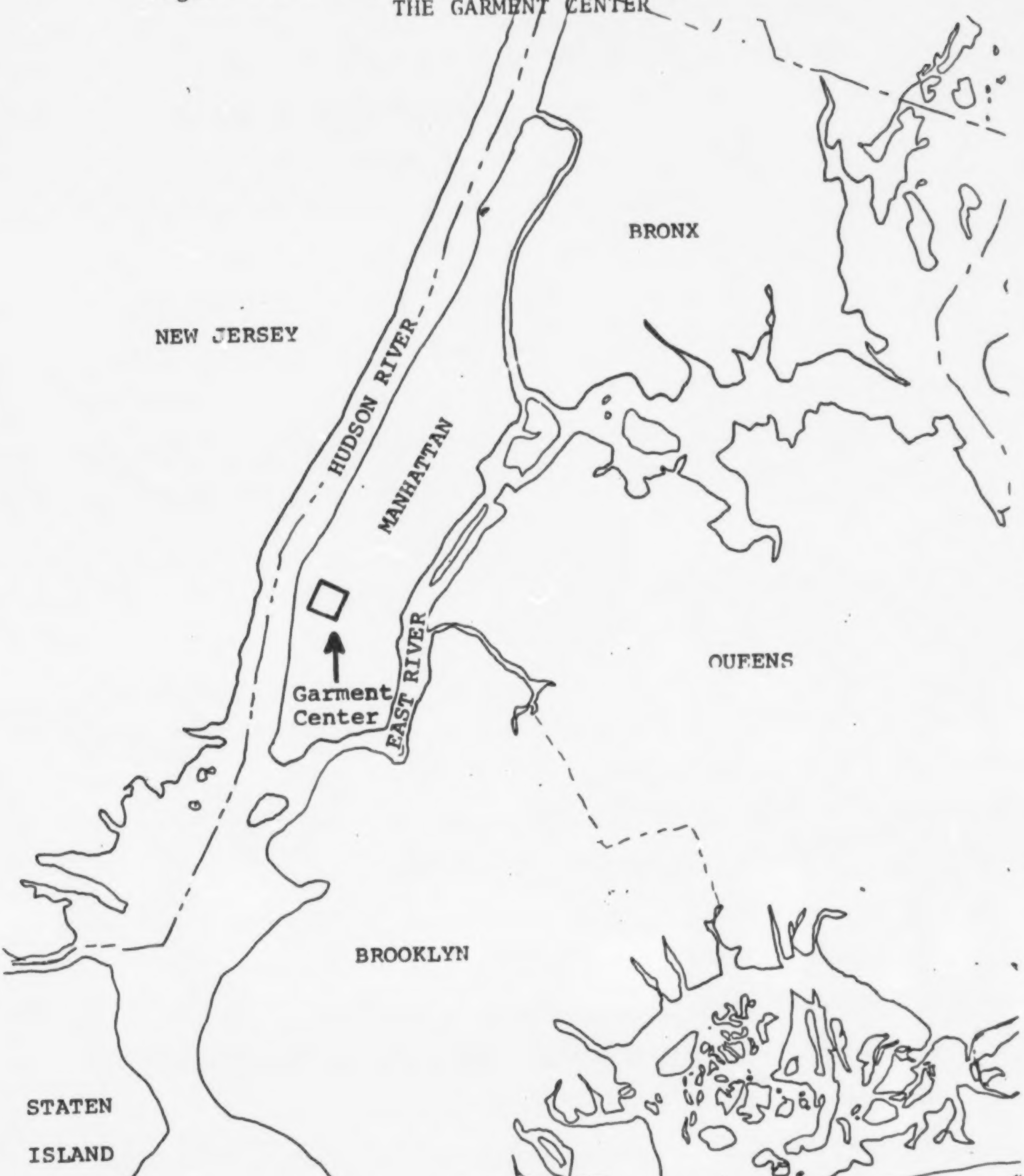
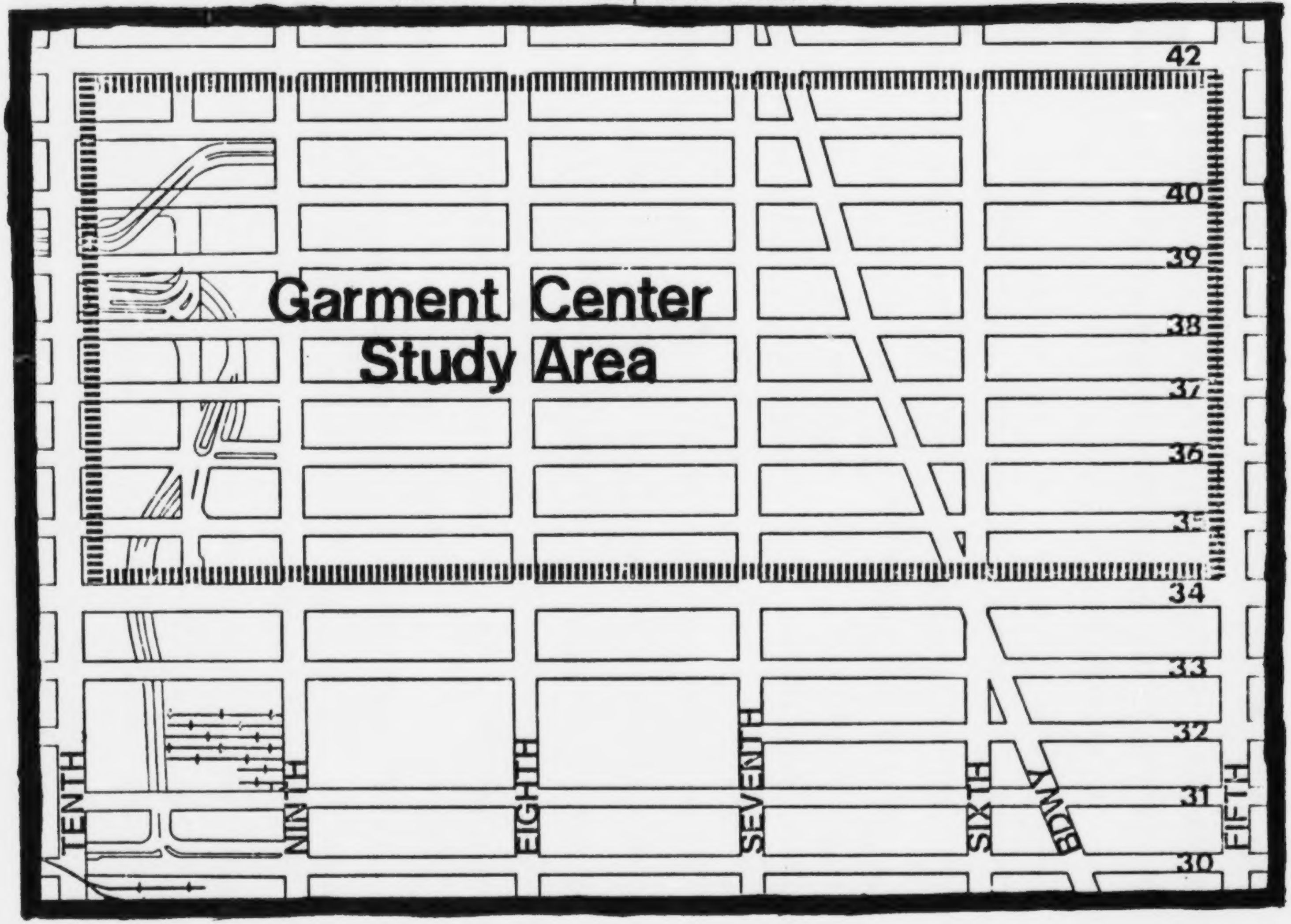

BRONX
NEW JERSEY
HUDSON RIVER
MANHATTAN
Garment Center
EAST RIVER
QUEENS
BROOKLYN
STATEN ISLAND

Figure III-2

GARMENT CENTER STUDY AREA BOUNDARIES


Garment Center
Study Area
42
40
39
38
37
36
35
34
33
32
31
30
TENTH
NINTH
EIGHTH
SEVENTH
SIXTH
BDWY
FIFTH

must be viewed.

The area selected for a study of the urban goods movement system was New York City's Garment Center. Figure III-1 indicates the location of the study area in relation to the New York Region. The Garment Center is situated in the core of Manhattan's Central Business District, CBD. The district serves as a major thoroughfare for traffic traveling between New Jersey and Long Island as well as north-south traffic. The Garment Center Study Area, an area that specializes in the production of women's and children's outerwear, is located between Fifth and Tenth Avenues and West 34th and West 42nd Streets, in the heart of Manhattan. The boundaries of the study area are shown in Figure III-2.

The principal industries of the area and their relative importance are shown in Table III-1. The apparel industry is the area's major industry. A predominant portion of the apparel produced is women's outerwear, consisting principally of sportswear, women's dresses of various prices, coats and suits, and children's wear.(1) There were approximately 3,000 apparel and textile firms employing more than 50,000 workers in the Garment Center study area during 1973. These segments accounted for 46 percent of the area's total employees. About 80 percent of the apparel workers were directly employed in the production of women's outerwear. An additional 8,000 were employed by children's wear, rainwear, and apparel accessory manufacturing firms. Dresses and sportswear, the largest categories of women's outerwear, account for 31 and 38 percent of the apparel manufacturing employment, respectively. Allied fields, such as transportation services and piece goods suppliers, employed an additional

Table III-1

Garment Center Employment and Firms

INDUSTRY	1973 FIRMS[1]	1973 EMPLOYEES[1]	PERCENT EMPLOYEES	1958 EMPLOYEES[2]
Textile Mill Products	305	6,037	5.2	5,600
APPAREL PRODUCTS	2,602	47,302	40.7	87,000
SPORTSWEAR	886	14,756	12.7	---
DRESSES	824	17,774	15.3	---
COATS & SUITS	397	6,668	5.9	---
CHILDREN'S WEAR	141	2,797	2.4	---
OTHER	354	5,307	4.5	---
Motor Freight Transportation	102	1,794	1.5	---
Transportation Services	4	48	--	---
Wholesale Trade	1,937	16,701	14.4	29,300
Other	3,006	44,345	38.2	---
TOTAL	7,959	116,227	100.0	---

[1] Mayor's Office of Apparel Industry Planning and Development. Firms operating with several names are counted more than once.

[2] "Employment Distribution in New York City and its Central Business District", Department of City Planning, 1961.

20,000 persons. Almost 8,000 firms, employing approximately 116,000 workers, were situated within the study area during 1973.

III.2 The Apparel Industry

The characteristics of women's outerwear apparel firms are discussed below.

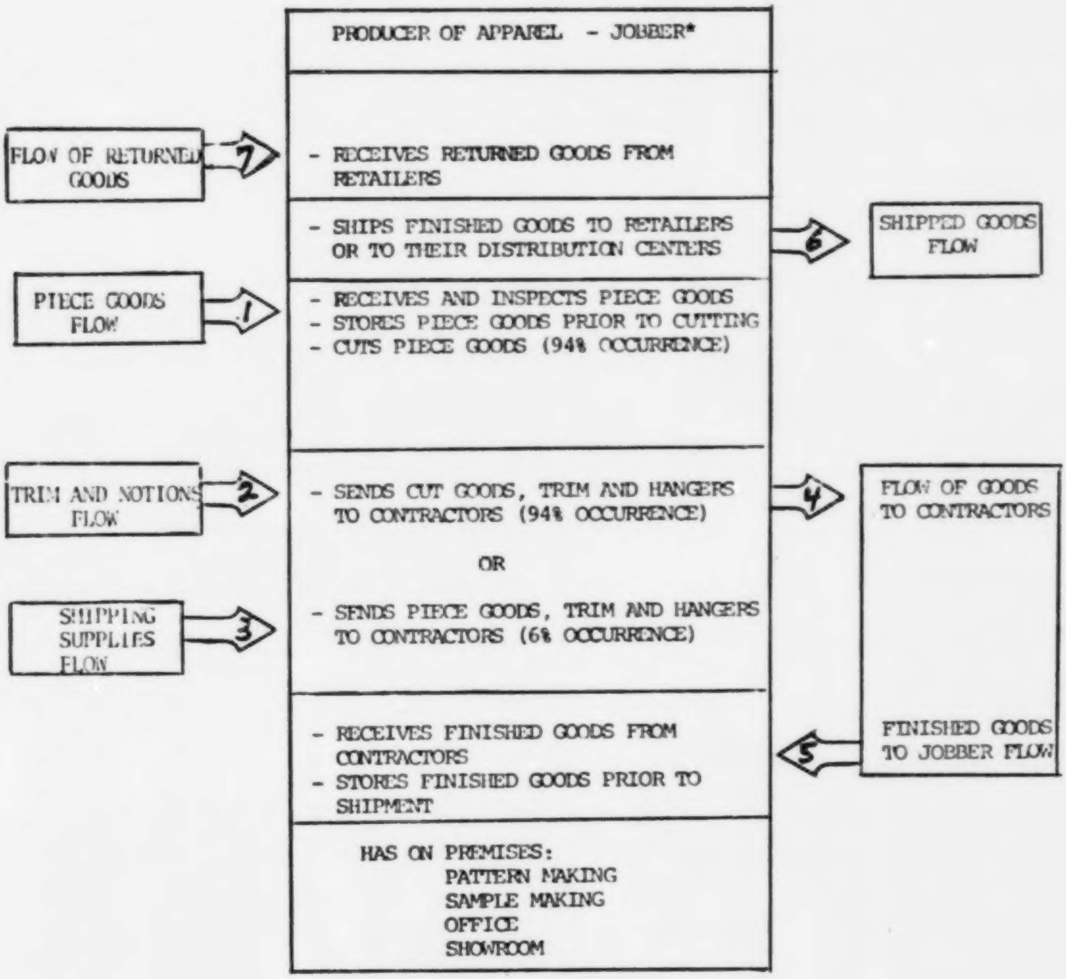
Apparel firms within the area maintain either just a showroom, where the firm's various styles are displayed to buyers, or a full range of manufacturing functions. The functions typically performed include piece goods (textiles) receipt and storage; the cutting of patterns and the shipment of these cut goods to contractors; receipt, storage, and shipment of finished goods; maintenance of showrooms, offices, and pattern and sample-making facilities. These firms, known as jobbers, are the area's predominant type of firm. If sewing operations are also maintained, then the firm is known as a manufacturer.

The apparel industry in the Garment Center is space-extensive; it utilizes about 400 square feet per employee to perform the functions mentioned. The average New York City apparel firm, in contrast, uses only 251 square feet per employee.

Annual rental rates range from approximately $2.00 per square foot on the side streets at the district's periphery to $10.00 per square foot on the prestigious Seventh Avenue and Broadway locations.

The flow of goods to and from the typical firm is illustrated in Figure III-3. The apparel production process begins with the receipt of piece goods, that is, large rolls of fabric. Most

GRAPHIC MODEL OF GOODS FLOW (Figure III-3)


PRODUCER OF APPAREL - JOBBER*
FLOW OF RETURNED GOODS
7
- RECEIVES RETURNED GOODS FROM RETAILERS
- SHIPS FINISHED GOODS TO RETAILERS OR TO THEIR DISTRIBUTION CENTERS
6
SHIPPED GOODS FLOW
PIECE GOODS FLOW
1
- RECEIVES AND INSPECTS PIECE GOODS
- STORES PIECE GOODS PRIOR TO CUTTING
- CUTS PIECE GOODS (94% OCCURRENCE)
TRIM AND NOTIONS FLOW
2
- SENDS CUT GOODS, TRIM AND HANGERS TO CONTRACTORS (94% OCCURRENCE)
OR
- SENDS PIECE GOODS, TRIM AND HANGERS TO CONTRACTORS (6% OCCURRENCE)
4
FLOW OF GOODS TO CONTRACTORS
SHIPPING SUPPLIES FLOW
3
- RECEIVES FINISHED GOODS FROM CONTRACTORS
- STORES FINISHED GOODS PRIOR TO SHIPMENT
5
FINISHED GOODS TO JOBBER FLOW
HAS ON PREMISES:
PATTERN MAKING
SAMPLE MAKING
OFFICE
SHOWROOM

*IF MANUFACTURER, THERE WOULD BE NO CONTRACTOR FLOW SEGMENT piece goods arrive from the South and New England (Step 1). Trim, notions, and shipping supplies originate equally within the Garment Center and within the Greater New York Region (Steps 2 and 3). Highly skilled cutters, using special machines, cut the fabric from the patterns of the original sample. Ninety four percent of the time this cutting operation is performed on the jobber's premises. The cut goods, trim and hangers are then sent out for sewing to a contractor located in another loft building within the Garment Center, or in the Region, or outside the Region. About 70 percent of the contracting work is performed in the Greater New York Region. Fifteen percent is done within the Garment Center itself; the remainder is done outside the Region and occasionally abroad (Steps 4 and 5). The sewn goods are usually returned to the manufacturer's establishment for storage prior to shipment. Approximately half the volume of finished goods is shipped directly to the consignee via carriers such as United Parcel Service and the U. S. Postal Service. A significant portion of the remaining volumes of finished garments are taken by the many trucking companies to northern New Jersey where major national retailers maintain consolidation centers (Step 6). These shipments are then distributed by the retailers to their branches throughout the country.

The apparel firms of the Garment Center tend to cluster by product type. Popular priced dresses cluster around Seventh Avenue and West 35th Street, couture at Seventh Avenue and West 39th Street, children's wear at Eighth Avenue and West 36th Street, coats and suits at Seventh Avenue and West 37th Street, and so on. Showrooms are concentrated along Seventh Avenue and Broadway, while contractors tend to locate in the western portions of the district and south of it where rental rates are lower.(2)

Table III-2 depicts some of the salient characteristics of Garment Center firms. These apparel firms tend to be small. The average number of employees per firm ranges from 32 in coats and suits to 41 in dresses. The annual sales volume varies from \$2.7 million for coats to \$5.0 million in children's wear. The wholesale value ranged from \$10.65 for sportswear to \$60.20 for coats and suits.

Due to the firms' small size and the proximity of suppliers, shipments are small and frequent. The average size of a piece goods delivery is less than 2,000 lbs. Other items, such as trim and shipping supplies, arrive in even smaller lots. Pick-up and delivery frequencies range from 3 deliveries per week for shipping supplies to 11 and 15 pick-ups per week for finished goods and trim and findings.

III.3 The Difficulties Encountered by Goods Movement

The difficulties experienced by the goods movement system in the study area can be ascribed to three major factors. They are, (a) the location of the area in Manhattan's Central Business District, CBD, (b) the physical character of the district's streets and buildings, and, (c) the characteristics of the industry situated in the study area.

The district's central location attracts many vehicles and pedestrians who use the district as a thoroughfare. These large

Table III-2

Number and Characteristics of Garment Center Outerwear Firms

APPAREL OUTERWEAR FIRMS[1]

	Sportswear	Dresses	Coats and Suits	Children's Wear
Garment Center Employees	14,756	17,774	6,668	2,797
Garment Center Firms[2]	466	434	209	74
Average Employees Per Firm	32	41	32	38
	Typical Firm Characteristics			
Annual Units Shipped	392,400	184,300	44,500	340,500
Average Wholesale Value	$10.65	$25.55	$60.20	$14.60
Annual Sales Volume	$4,179,000	$4,710,000	$2,679,000	$4,972,000
Weight of Piece Goods Required (pounds)	825,100	718,900	287,100	311,600
Piece Goods Delivery Frequency	8 Deliveries per Week			
Weight of Trim and Findings Required (pounds)	20,600	18,000	7,200	7,800
Trim and Findings Delivery Frequency	15 Deliveries per Week			
Weight of Shipping Supplier Required (pounds)	53,000	24,900	11,100	41,100
Shipping Supplies Delivery Frequency	3 Deliveries per Week			
Shipping Goods Pick-up Frequency	11 Pick-ups per Week			

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[1] Apparel Industry Questionnaire, TAD, Manhattan Garment Center Urban Goods Movement Study, 1974.

[2] Firms operating with several names are counted only once.

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volumes within the confines of a small area lead to conflicts and congestion. Major generators of vehicular and pedestrian activity surround the Garment Center. North of the district, there is a concentration of office buildings and theatres; to the east and south, there are many nationally known retailers such as Macy's and Lord and Taylor's, as well as office buildings; to the west, there is a concentration of truck terminals. Major passenger transportation nodes, the Port Authority of New York and New Jersey Bus Terminal, the Pennsylvania Railroad Station and the Grand Central Railroad Terminal are located on the district's periphery. The nearby Lincoln Tunnel, connecting Manhattan and New Jersey, is used as a passenger and freight conduit. The high pedestrian and vehicular volumes observed are thus due to the many who traverse the district, in addition to those who work and shop there.

The physical character of the district, its tall antiquated buildings and their lack of adequate loading and unloading facilities, is another factor responsible for goods movement difficulties.

The numerous tall buildings in the Garment Center are mainly between 12 and 20 stories high. The vast majority were built prior to World War II and, consequently, have antiquated elevators and lack off-street loading facilities. Lofts, buildings with large undivided floor areas, are the predominant type of structure in the area. The other major land use type is commercial office space.

Within the study boundaries, over 700 buildings with 43.7 million square feet of space are occupied by almost 8,000 firms, employing approximately 116,000 workers. About 45 percent of the firms and workers are employed directly by the apparel industry. Apparel firms in the Garment Center are concentrated along Seventh Avenue from West 34th Street to West 40th Street. Although this Core accounts for only 20 percent of the district's surface area, nearly half the square footage, firms and employees of the Center are located there. The concentration of tall antiquated buildings in as small a compact area is another factor responsible for the area's congestion.

Garment Center apparel firms require a large amount of undivided space for their cutting and sewing operations. The area's loft buildings meet this space requirement. The district's buildings and the area's accessibility to low-skilled, low-wage workers and to buyers were the factors responsible for the concentration of apparel firms in the area.

Goods movement in the Garment Center is performed mainly by truck and handcart. Trucks carry the various apparel materials into and out of the district. Hand-operated vehicles are used to transport goods within the district, i.e., to and from apparel and apparel-related firms.

The large volumes of vehicular and pedestrian traffic and the many handcarts in the district result in congestion. The pressures of this congestion appear on the sidewalks, curbsides, and crosswalks of the Garment Center.(3)

The characteristics of the apparel industry, the smallness of the typical firm, the fragmented nature of the industry and the resultant need for multiple handlings, also contribute to the difficulties of goods movement.

Apparel industry traits are a direct result of the needs of the goods produced. Apparel fashions are usually in a state of flux; they are ever changing. The goods produced are not standardized and, consequently, mass production techniques can not be employed. The apparel firms are relatively small to maintain flexibility to changing style and demand conditions. The average Garment Center firm employs fewer than 40 workers and has a sales volume slightly greater than four million dollars. Being small, apparel firms tend to specialize in just one facet of the production process. This enables them to minimize their costs. The flows that result from the fragmentation of the industry were shown in Figure III-3.

Each firm is not self-sufficient, but requires the existence of other apparel firms. To take advantage of the economies of agglomeration and to produce efficiently, various producers and suppliers concentrate within easy access of each other. Historically, the Garment District has served as the area of concentration.

Because of the small size of firms and the proximity of suppliers, shipments are frequent and small. For example, the average piece goods delivery is less than 2,000 lbs. A typical firm receives piece goods 8 times per week.

As previously mentioned, the many handcart and truck trips observed on the streets of the study area are, thus, a direct consequence of the smallness of firms and of the fragmentation and concentration of the industry within the district.

In conclusion, the difficulties experienced by the goods movement system in the Garment Center can be ascribed to three major factors. They are: (a) the characteristics of the industry itself, i.e., the smallness of the typical firm, the fragmented nature of the industry, with the resultant need for multiple handlings; (b) the physical character of the district, including its antiquated buildings with inadequate loading and unloading facilities, concentrated within a small area; and (c) its location in Manhattan's Central Business District, (CBD), and its use as a thoroughfare for both vehicles and pedestrians.

Chapter III - Footnotes

1. Sportswear clothing tends to be informal and versatile in usage. It is accorded a separate category within women's outerwear, since it does not fit into the traditional definition of the other segments of women's outerwear.

2. The sample blocks utilized for detailed data gathering were selected to obtain a cross-section of the various types of firms found in the area. The following are the sample blocks selected:

   West 35th Street, between Seventh and Eighth Avenues
   West 36th Street, between Seventh and Broadway
   West 37th Street, between Seventh and Eighth Avenues
   Seventh Avenue, between West 39th and West 37th Streets

3. Chapters IV and VII discuss these traffic flows and conflicts more fully.

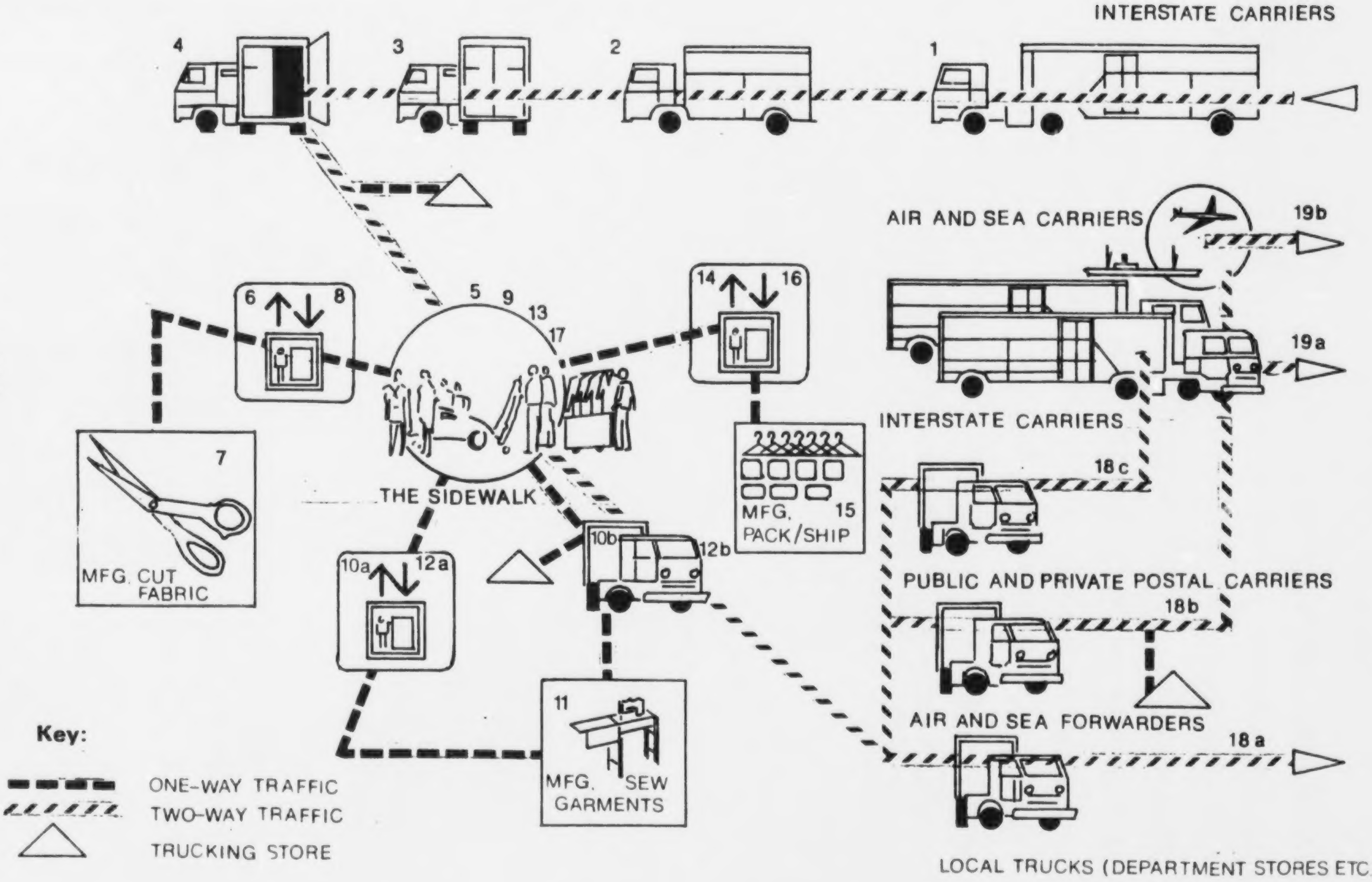
IV. Transportation Characteristics

This chapter will discuss the process of garment assembly from the transportation perspective. Such characteristics as the area's traffic, both apparel-related and non-apparel-related traffic, the district's large variety of transportation carriers, and trucking stores, which are mini-consolidation centers, will be discussed. These several flows result in large volumes of vehicles, slow travel speeds, long delivery times, and conflicts with pedestrians. Two graphic models, one depicting the flows to and from the average apparel firm and the other showing the flows for the whole district, are presented as an aid to a better understanding of the complexity of goods movement.

The multiple flows necessary for apparel production require that goods be transportated from one location to another within and outside the Garment Center. The apparel transportation flow chart, Figure IV-1, indicates the pervasiveness of trucking in the garment assembly process. Interstate carriers bring textiles into the district, (steps 1-4). These piece goods are either stored temporarily in trucking stores or delivered to manufacturing firms via the elevators, (steps 5-6). There the textiles are cut into patterns, (step 7), returned to the street via elevators, (steps 8-9), and sent to contractors. If the contractor is located in another loft building within the area, the transportation flow is shown by steps 10a, 11, 12a. The more common occurrence is for the

APPAREL TRANSPORTATION FLOW CHART

Figure IV = 1


INTERSTATE CARRIERS
4
3
2
1
AIR AND SEA CARRIERS
19b
19a
5
9
13
17
6
8
14
16
7
MFG. CUT FABRIC
THE SIDEWALK
MFG. 15 PACK/SHIP
INTERSTATE CARRIERS
18c
10a
12a
10b
12b
PUBLIC AND PRIVATE POSTAL CARRIERS
18b
11
MFG. SEW GARMENTS
AIR AND SEA FORWARDERS
18a
LOCAL TRUCKS (DEPARTMENT STORES ETC.)
Key:
ONE-WAY TRAFFIC
TWO-WAY TRAFFIC
TRUCKING STORE

goods to go out of the area, usually in intermediate trucks and vans, (steps 10b, 11, 12b). After being sewn, the garments are returned to the jobber-manufacturer (steps 13-14) to be packed, (step 15), picked up by the various carrier companies, (steps 16-17), and shipped to retailers throughout the country directly or via a consolidated distribution center, (steps 18-19). Trucks are used primarily to carry goods into and out of the district. Handcarts, racks, and box carts are utilized to transport the goods to and from parked vehicles and between apparel firms.

IV.1 Apparel Flow Models

Two graphic models were developed as an aid to a better understanding of the complex nature of the goods movement process. These models incorporated the results obtained from surveys such as the apparel questionnaire, handcart activity observations, parking proximity, district transportation data, and land-use data, (see Chapter VII).

(a) The Micro-Scale Model

The first model, the micro-scale model, describes the goods flow of the typical jobber within the Garment Center. Seven major flow activities are analyzed. They are:

- Returned Goods Flow
- Piece Goods Flow
- Trim and Notions Flow
- Shipping Supplies Flow
- Shipped Goods Flow

- Flow of Goods to Contractors for Assembly and Return Flow of Finished Goods to Jobber
- Finished Goods Flow

For each of the major flow segments, the following information is provided.

- The material flows and their origins and destinations
- The distances and times required to perform pickups and deliveries
- The type of handcart employed and activities performed
- The transportation companies used for each type of materials flow

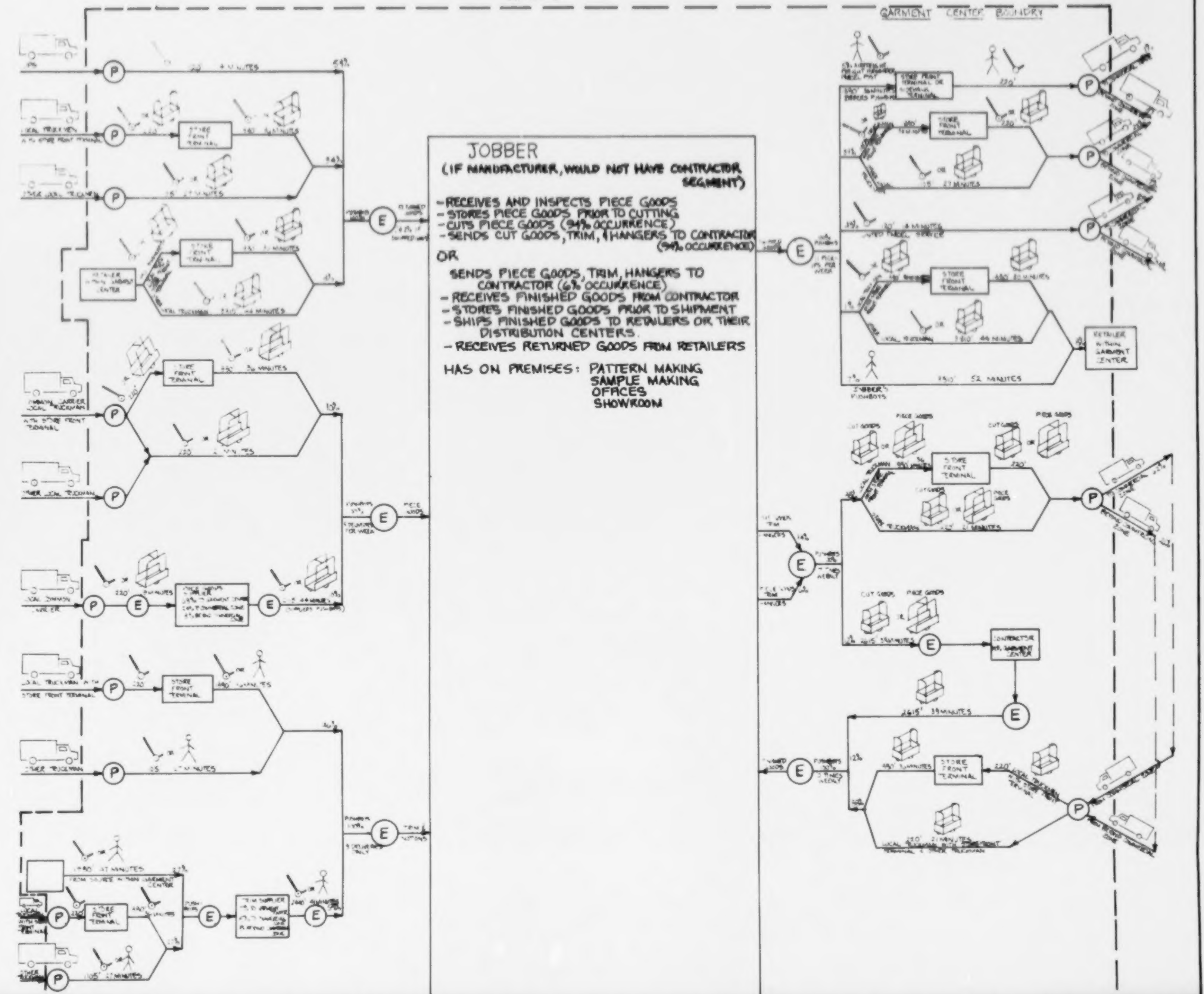
The micro-scale model developed is shown as Figure IV-2. For example, the model indicates that for piece goods

- All deliveries arrive in the district by truck.
- 90 percent of the deliveries originate outside the Center.
- Deliveries from storefront terminals cover 1880 feet and take 36 minutes to complete.
- Piece goods suppliers supply 10 percent of the jobber's orders; an average delivery lasts 44 minutes and covers 2115 feet.
- The average jobber gets 8 deliveries of piece goods per week.
- Piece goods handtruck is the major form of materials handling equipment.

Thus, the micro-scale model provides, at a glance, the principal flows and the magnitude of material movement that occurs on Garment Center streets. In addition, the sum of all the flows and their complexity can be noted. The model can

FIGURE IV-2

GRAPHIC MICRO MODEL OF GOODS FLOW
MANHATTAN GARMENT CENTER URBAN GOODS MOVEMENT STUDY
SKETCH 6



JOBBER
(IF MANUFACTURER, WOULD NOT HAVE CONTRACTOR SEGMENT)

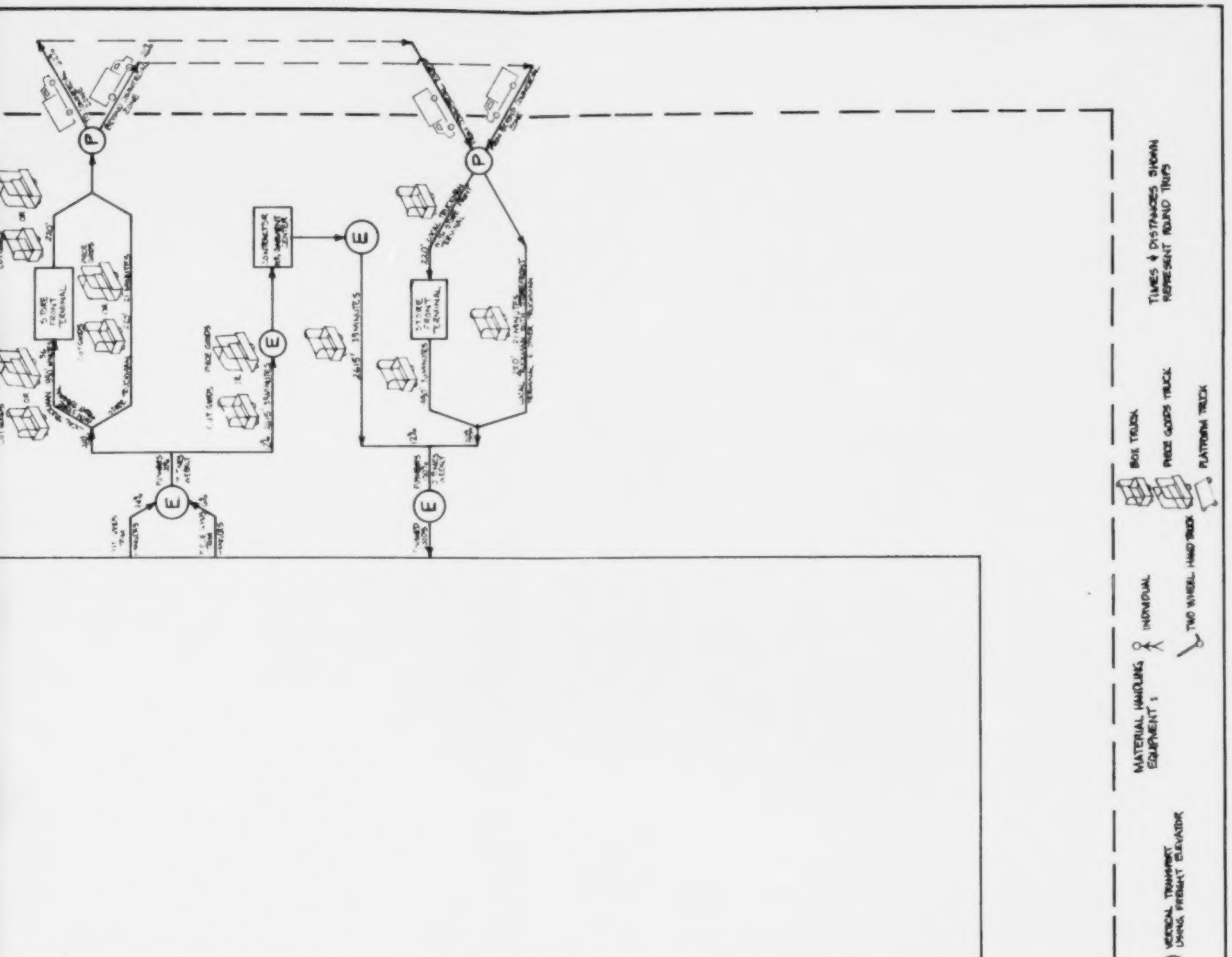
- RECEIVES AND INSPECTS PIECE GOODS
- STORES PIECE GOODS PRIOR TO CUTTING
- CUTS PIECE GOODS (94% OCCURRENCE)
- SENDS CUT GOODS, TRIM, & HANGERS TO CONTRACTOR (94% OCCURRENCE)

OR

SENDS PIECE GOODS, TRIM, HANGERS TO CONTRACTOR (6% OCCURRENCE)
- RECEIVES FINISHED GOODS FROM CONTRACTOR
- STORES FINISHED GOODS PRIOR TO SHIPMENT
- SHIPS FINISHED GOODS TO RETAILERS OR THEIR DISTRIBUTION CENTERS.
- RECEIVES RETURNED GOODS FROM RETAILERS

HAS ON PREMISES: PATTERN MAKING
SAMPLE MAKING
OFFICES
SHOWROOM

GARMENT CENTER BOUNDRY
P
E
STORE FRONT TERMINAL
RETAILER WITHIN GARMENT CENTER
4 MINUTES
54%
27 MINUTES
44 MINUTES
36 MINUTES
19%
220'
220'
OTHER LOCAL TRUCKMAN
LOCAL COMMON CARRIER
WITH STORE FRONT TERMINAL
(SUPPLIERS PUSHBOYS)
LOCAL TRUCKMAN WITH STORE FRONT TERMINAL
490'
OTHER TRUCKMAN
FROM SOURCE WITHIN GARMENT CENTER
TRIM SUPPLIER
OTHER TRUCKMAN
105'
TRIM & NOTIONS
PIECE GOODS
STORE FRONT TERMINAL OR SIDEWALK TERMINAL
220'
27 MINUTES
14 MINUTES
44 MINUTES
52 MINUTES
JOBBER'S PUSHBOYS
CUT GOODS
PIECE GOODS
OR
21 MINUTES
2615' 39 MINUTES
CONTRACTOR IN GARMENT CENTER
STORE FRONT TERMINAL
220'
LOCAL TRUCKMAN WITH STORE FRONT TERMINAL
12%
2 TIMES WEEKLY
FINISHED GOODS
220' 21 MINUTES
LOCAL TRUCKMAN WITH STORE FRONT TERMINAL & OTHER TRUCKMAN
ZONE


STORE FRONT TERMINAL
TIMES & DISTANCES SHOWN REPRESENT ROUND TRIPS
SYMBOLS:
INTERSTATE TRUCK OR VAN
P PARK TRUCK WITH LOAD AND/OR UNLOAD OPERATION
E VERTICAL TRANSPORT USING FREIGHT ELEVATOR
MATERIAL HANDLING EQUIPMENT:
INDIVIDUAL
TWO WHEEL HAND TRUCK
BOX TRUCK
PIECE GOODS TRUCK
PLATFORM TRUCK

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provide information on the multiplicity of movement implicit in the garment production process. For example, if one conservatively assumes that the jobber has one source each for piece goods, trim and notions, and shipping supplies, the components of a typical garment would generate up to 13 elevator trips, 7 parked trucks either loading and unloading, 14 handcart trips involving a combined round trip distance of 23,145 feet and lasting 407 minutes.

Utilizing the micro scale model as a base, the total quantity of goods flowing into and out of the Center is developed. The material requirements, transportation and flows resulting from the production of a finished garment, as developed in the micro model, is expanded to the whole study area. The number of apparel firms and employment levels of the district in 1973 served as the expansion factor.

The flow of goods into and out of the district reflect:

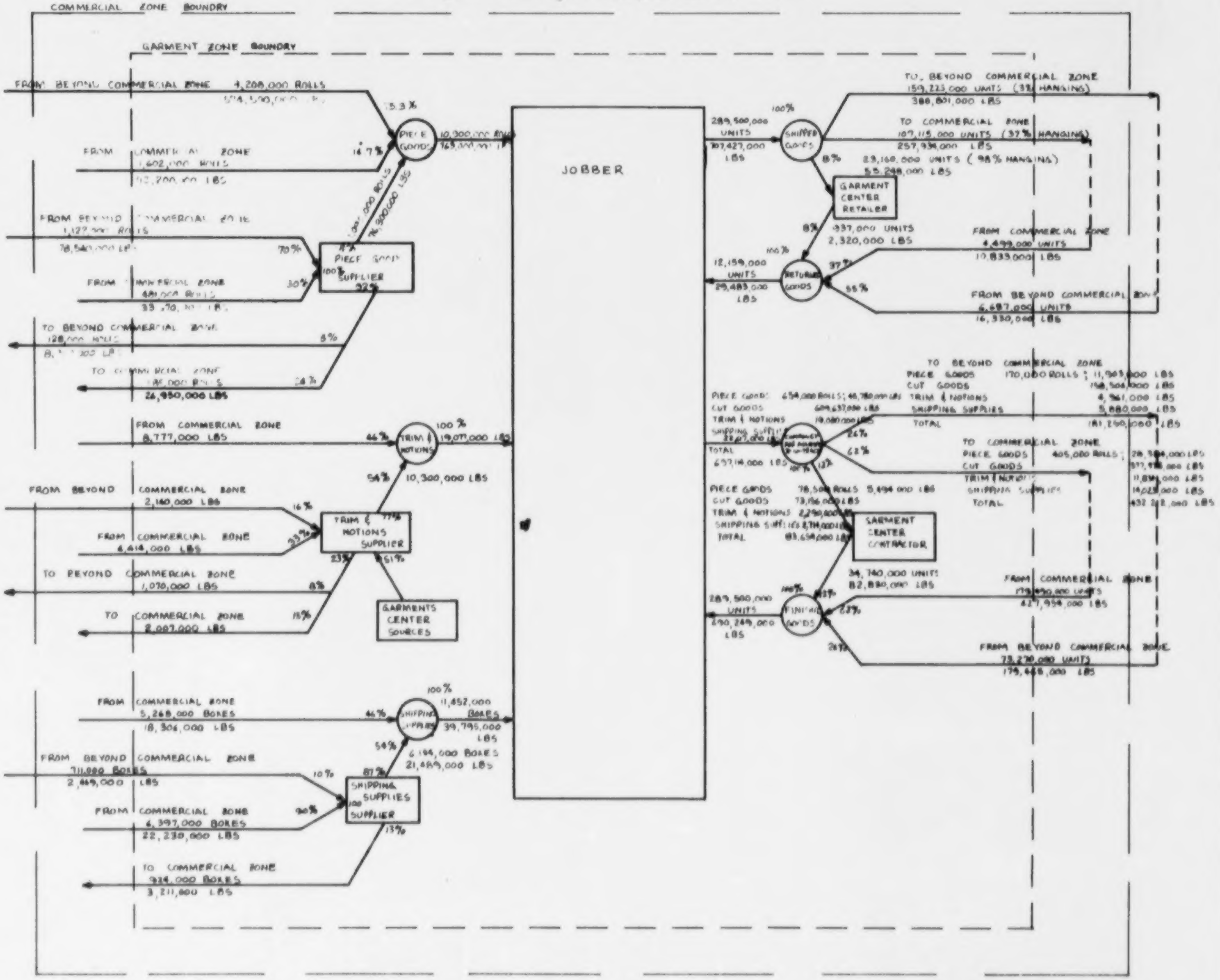
- truck type size, and load characteristics
- type of commodity transported
- location of facilities including storefront terminals

(b) The Macro-Scale Model

The macro scale model developed is shown as Figure IV-3. It indicates that nearly 800 million lbs. of piece goods flow in and 35 million lbs. flow out per annum, that 40 million lbs. of shipping supplies flow in and 3 million lbs. flow out, and that 29 million lbs. of finished apparel goods are returned annually. Thus these two models provide an indication of the volumes and levels of activity in the Garment Center.

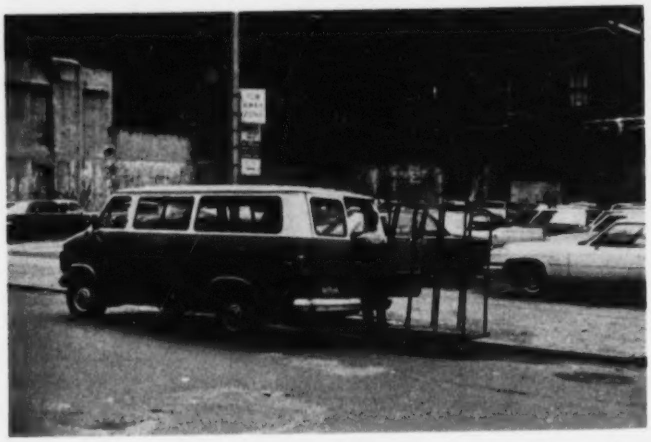
Figure IV-3

Graphic Macro Model of Goods Flow

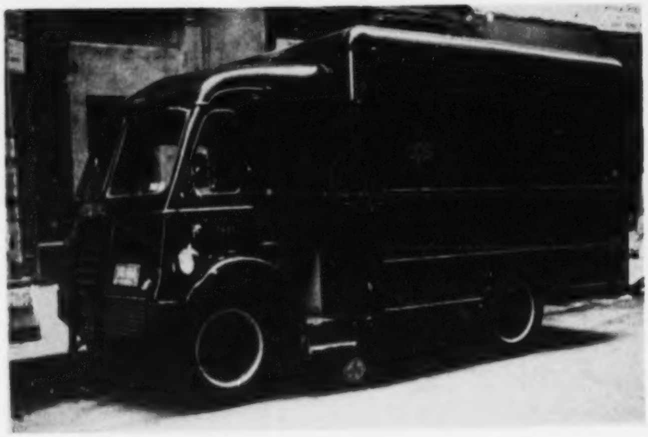

COMMERCIAL ZONE BOUNDRY
GARMENT ZONE BOUNDRY
FROM BEYOND COMMERCIAL ZONE 4,208,000 ROLLS
15.3%
PIECE GOODS
10,300,000 ROLLS
FROM COMMERCIAL ZONE
14.7%
FROM BEYOND COMMERCIAL ZONE
78,540,000 LBS
70%
PIECE GOOD SUPPLIER
100%
32%
FROM COMMERCIAL ZONE
30%
76,900,000 LBS
TO BEYOND COMMERCIAL ZONE
128,000 ROLLS
8%
TO COMMERCIAL ZONE
26,950,000 LBS
24%
FROM COMMERCIAL ZONE
8,777,000 LBS
46%
TRIM & NOTIONS
100%
19,077,000 LBS
54%
10,300,000 LBS
FROM BEYOND COMMERCIAL ZONE
2,160,000 LBS
16%
TRIM & NOTIONS SUPPLIER
FROM COMMERCIAL ZONE
6,414,000 LBS
33%
23%
61%
TO BEYOND COMMERCIAL ZONE
1,070,000 LBS
8%
TO COMMERCIAL ZONE
2,007,000 LBS
15%
GARMENTS CENTER SOURCES
FROM COMMERCIAL ZONE
5,268,000 BOXES
18,306,000 LBS
46%
SHIPPING SUPPLIES
100%
11,452,000 BOXES
39,795,000 LBS
54%
6,184,000 BOXES
21,489,000 LBS
FROM BEYOND COMMERCIAL ZONE
711,000 BOXES
2,469,000 LBS
10%
87%
SHIPPING SUPPLIES SUPPLIER
100
FROM COMMERCIAL ZONE
6,397,000 BOXES
22,230,000 LBS
90%
13%
TO COMMERCIAL ZONE
934,000 BOXES
3,211,000 LBS
JOBBER
289,500,000 UNITS
707,427,000 LBS
100%
SHIPPED GOODS
TO, BEYOND COMMERCIAL ZONE
159,223,000 UNITS (3% HANGING)
388,801,000 LBS
TO COMMERCIAL ZONE
107,115,000 UNITS (37% HANGING)
257,938,000 LBS
8%
23,160,000 UNITS (98% HANGING)
55,288,000 LBS
GARMENT CENTER RETAILER
8%
937,000 UNITS
2,320,000 LBS
100%
12,159,000 UNITS
29,483,000 LBS
RETURNED GOODS
37%
55%
FROM COMMERCIAL ZONE
4,499,000 UNITS
10,833,000 LBS
FROM BEYOND COMMERCIAL ZONE
6,687,000 UNITS
16,330,000 LBS
PIECE GOODS 654,000 ROLLS; 46,780,000 LBS
CUT GOODS 609,637,000 LBS
TRIM & NOTIONS 19,080,000 LBS
SHIPPING SUPPLIES
TOTAL
697,14,000 LBS
26%
62%
12%
TO BEYOND COMMERCIAL ZONE
PIECE GOODS 170,000 ROLLS; 11,903,000 LBS
CUT GOODS
TRIM & NOTIONS 4,961,000 LBS
SHIPPING SUPPLIES 5,880,000 LBS
TOTAL 181,290,000 LBS
TO COMMERCIAL ZONE
PIECE GOODS 405,000 ROLLS
CUT GOODS
TRIM & NOTIONS
SHIPPING SUPPLIES
TOTAL
PIECE GOODS 78,500 ROLLS 5,494,000 LBS
CUT GOODS 73,196,000 LBS
TRIM & NOTIONS 2,290,000 LBS
SHIPPING SUPPLIES
TOTAL 83,654,000 LBS
GARMENT CENTER CONTRACTOR
34,740,000 UNITS
82,880,000 LBS
100%
289,500,000 UNITS
690,249,000 LBS
FINISHED GOODS
12%
62%
26%
FROM COMMERCIAL ZONE
427,954,000 LBS
FROM BEYOND COMMERCIAL ZONE
73,270,000 UNITS
175,465,000 LBS

UNITED MARLBORO CARRIERS
ED-MARLBORO
CARRIERS

Intermediate truck



Panel truck



UPS truck

YOUR DELI
COFFEE & CAKE
Come to where the flavor is.

Specialized carrier van

VEHICLE TYPES SERVICING THE GARMENT CENTER

IV.2 Traffic Characteristics

The large volumes of materials flowing into and out of the Garment Center and the different characteristics of these flows require a variety of transportation carriers to serve the district. This section will describe the volume and type of vehicles on the Garment Center streets, and their typical travel times. In the next Section IV-3, street travel times will be related to off-street delivery times.

The type of trucking companies observed in the Garment Center includes over-the-road carriers, (companies licensed to carry interstate shipments), specialized carriers, (companies limiting their activities to the greater metropolitan region and concentrating on apparel), freight forwarders, (firms that pick-up small shipments, consolidate them into car and truck loads, and ship them to their destinations, usually via rail), air freight forwarders, (companies consolidating and shipping goods by air), and specialized firms such as REA Express, United States Postal Service, and United Parcel Service.

A diverse group of vehicle types carry Garment Center goods. Large 3-axle trucks, operated by over-the-road carriers, are used to bring piece goods from the South and New England. Intermediate trucks (2 axle), known as straight jobs, and vans carry cut goods to contractors, finished goods to jobbers, and packaged goods to various consolidation points. These types account for approximately 70 percent of the vehicles

Figure IV-4
Vehicles Crossing Cordon
24 Hour Weekday
(Summer 1973)

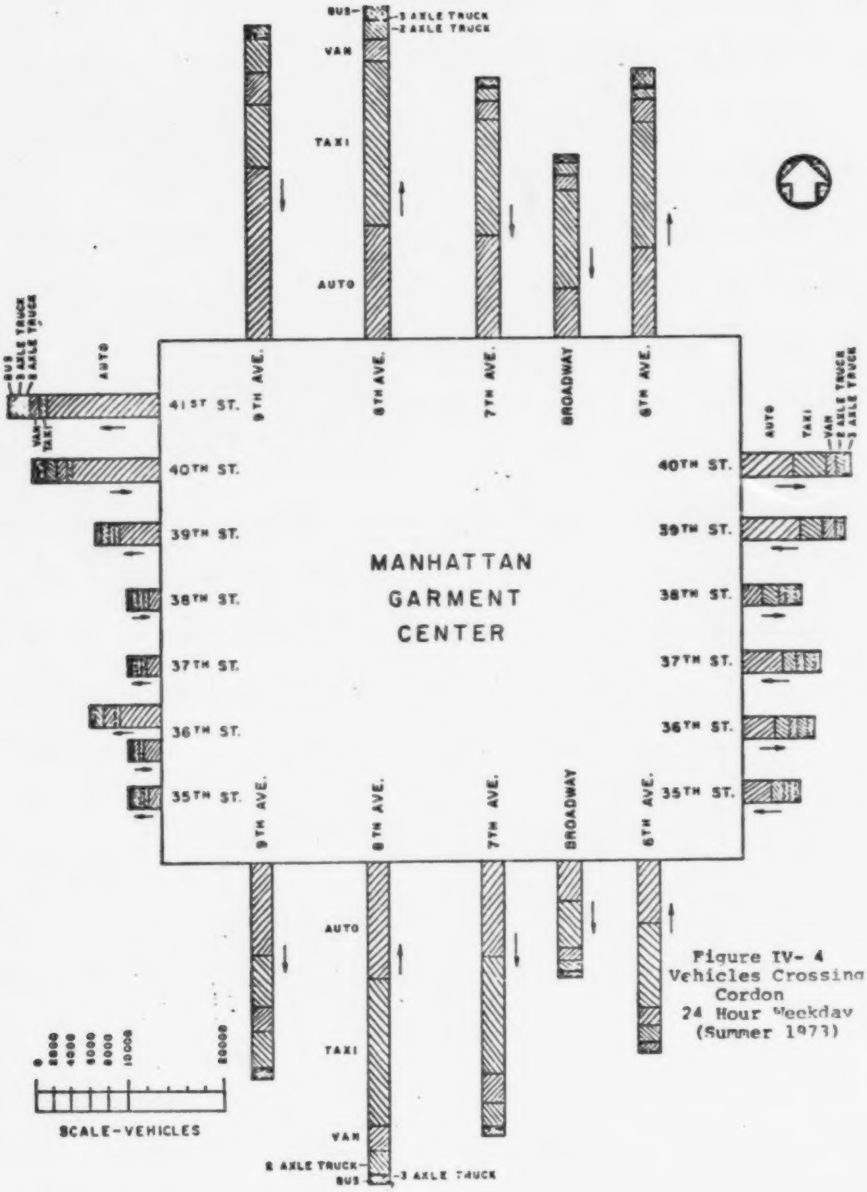


Figure IV- 4
Vehicles Crossing
Cordon
24 Hour Weekday
(Summer 1973)

frequenting the district during a typical day. In addition, specially designed vans and trucks of the United States Postal Service and United Parcel Service are utilized to carry packaged goods.

Non-garment related trucking activity also exists in the area. Trucks delivering food to the district's restaurants, vehicles collecting refuse, service vans from Bell Telephone System and Consolidated Edison Company, and other service vehicles such as air conditioning repair and building maintenance vans can be seen on the streets. A majority of the trucks in the area, however, are directly involved in garment-related activities.

In addition to the vehicles needed to transport apparel goods, the central location of the district attracts high volumes of through traffic. The cordon counts showed that during a typical 24 hour period in May over 185,000 vehicles entered the study area: 82,300 automobiles, 61,500 taxis, 16,700 vans, 16,000 2-axle trucks, 2,500 3-axle trucks, and 6,500 buses.

Figure IV-4 depicts the distribution of Garment Center vehicles crossing the area's boundaries by street and vehicle type. North-south traffic is concentrated on Seventh, Eighth, and Ninth Avenues. Automobiles and taxis are the major vehicle types traversing these roadways. On east-west streets, vehicular activity is concentrated on West 39th and West 40th Streets. Automobiles are the predominant vehicle type. converging in the vicinity of the Lincoln Tunnel. Buses and

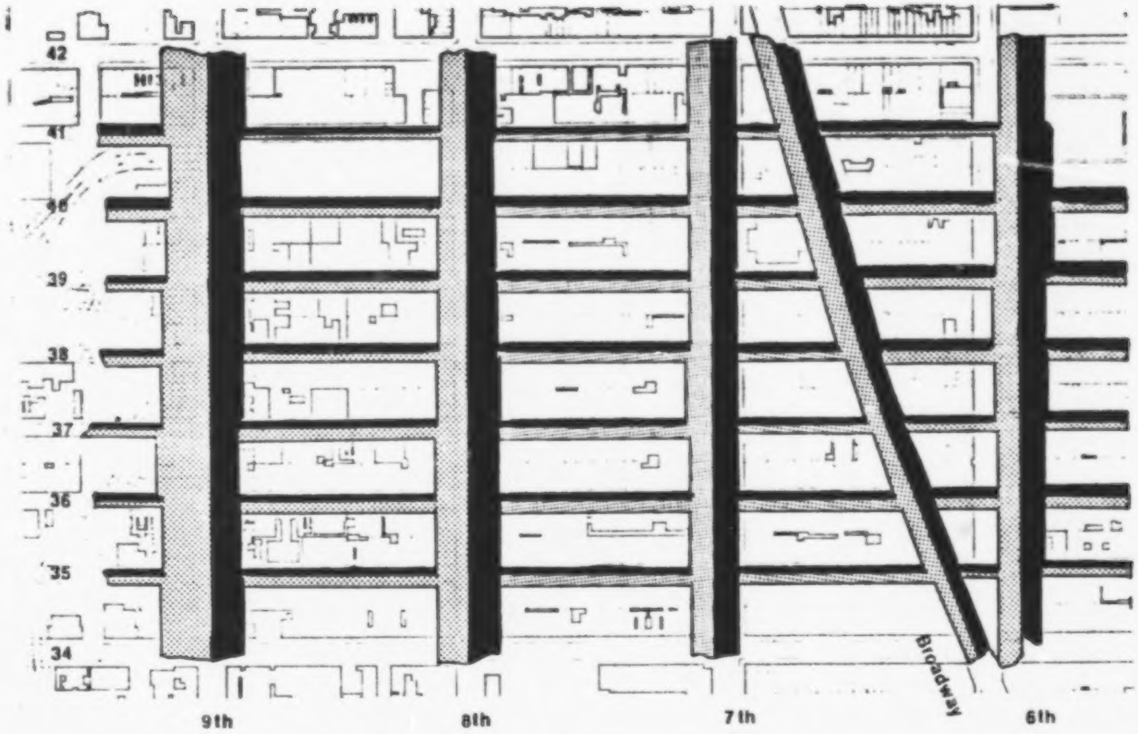

42
41
40
39
38
37
36
35
34
9th
8th
7th
Broadway
6th

Figure IV - 5

DISTRICT TRAFFIC VOLUMES

VANS & TRUCKS

■ VANS
▨ 2 & 3 AXLE TRUCKS

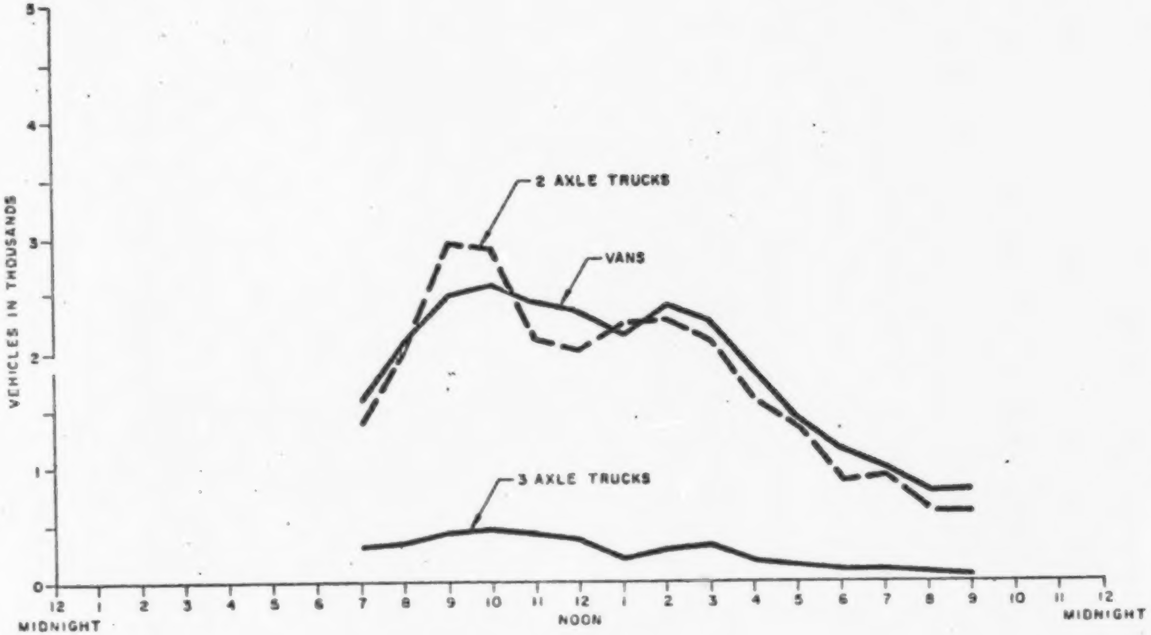


Figure IV-6 HOURLY VARIATION OF
TRUCKS
CROSSING STUDY AREA BOUNDARY

taxis accumulate near the Port Authority Bus Terminal, especially during rush hours.

The distribution of vans and trucks, the principal modes of goods movement within the Garment District, is exhibited in Figure IV-5 Trucks and vans tend to use Eighth and Ninth Avenues as the primary north-south routes. The crosstown streets in the southern portion of the district, West 35th, West 36th, and West 37th Streets, are the thoroughfares where trucks are concentrated. Vans appear to be evenly distributed throughout the east-west roadways.

Figure IV-6 shows the hourly variations of trucks and vans. Two peaks of activity are discernible; 9:00 A.M. and 2:00 P.M. These periods of truck peaking observed are thus similar to those noted in other cities, such as Chicago. Heavy trucks, 3-axle vehicles, exhibit slight fluctuations in hourly volumes.

The district-wide average travel rate (including delays) observed during the day was close to 6 m.p.h. on the streets and 11 m.p.h. on the avenues.(1) The typical vehicle travels approximately a half-mile within the Garment Center. These slow vehicle speeds are caused primarily by conflicts with parking and double parked vehicles, intersection queue delays, handcarts and pedestrians.

The factors responsible for the slow trip speeds and their magnitudes for four sample blocks are shown in Table IV-1. The average amount of time needed to traverse the

Table IV - 1

TRIP TIMES AND CAUSES OF DELAY

	Block Segments			
	W. 35 St	W. 36 St.	W. 37 St.	Seventh Ave
Roadway Length (feet)	840	580	840	485
Total Average Trip Time (sec)	146.5	127.4	196.2	61.9
Total Average Trip Speed (mph)	3.9	3.1	2.9	5.3
Sunday Optimum Trip Time (sec)[a]	25.0	17.3	25.0	14.0
Percent of Total Trip Time	17%	14%	13%	23%
Average Stop Delay Time (sec)	70.2	77.9	110.0	21.4
Percent of Total Trip Time	48%	61%	56%	35%
Intersection Queue				
Average Delay per Trip (sec)	38.2	66.8	81.8	20.0
Percent of Total Trip Time	26%	53%	42%	33%
Average Delay per Stop (sec)	38.2	45.3	43.2	34.0
Parking and Unparking Vehicles				
Average Delay per Trip (sec)	20.7	5.5[b]	13.9	0.6[c]
Percent of Total Trip Time	14%	4%	7%	1%
Average Delay per Stop (sec)	40.7	25.3	33.3	15.5
Double Parked Vehicles				
Average Delay per Trip (sec)	11.0	5.6	14.3	0.8[c]
Percent of Total Trip Time	8%	4%	7%	1%
Average Delay per Stop (sec)	42.0	44.2	56.0	21.1
Pushcart and Pedestrian Conflicts				
Average Delay per Trip (sec)	0.3	----	----	----
Percent of Total Trip Time	----	----	----	----
Average Delay per Stop (sec)	8.8	----	----	----
Frictional Delay Time (sec)[d]	51.3	32.2	61.2	26.5
Percent of Total Trip Time	35%	25%	31%	42%

[a] Derived from selected Garment Center arteries

[b] Includes delays resulting from vehicles entering and leaving off-street parking garages.

[c] Includes delays

[d] Frictional delay time equals total trip time less optimum trip time less stop delay time.

blocks ranged from 62 seconds on Seventh Avenue to 196 seconds on West 37th Street. Because of the different lengths of the sample blocks, an examination of speeds provides a better measure of delays. Seventh Avenue exhibits the faster speeds, 5.3 m.p.h., while West 37th Street has the lowest, 2.9 m.p.h.

Delays account for between 77 percent to 87 percent of the time spent traversing the sample blocks.(2) Several causes of delay were isolated; they are intersection queues, parking and unparking vehicles, double parked vehicles, and pedestrian and handcart conflicts. Certain delays could not be pinpointed as to the particular cause and are called frictional delays.(3) The major identifiable delay time was intersection queue accounting for between 26 percent to 53 percent of the time spent traversing the roadway.

Mid-block delays were most evident on the narrow crosstown streets. Trucks entering or leaving curbside parking spaces resulted in delays of 41 seconds on West 35th Street, a roadway that has only one moving lane of traffic. Seventh Avenue, which has four moving lanes of traffic, experienced only 15 seconds of delay due to vehicles parking and unparking. This is only 1/3 the delay experienced on West 35th Street and only half the delay experienced on the other two blocks.

Double parked vehicles restrict the flow of traffic noticeably along the street segments. Identifiable delays attributed to double parked vehicles ranged from 1 to 8 percent

Turning movement conflicts

BETTER METHODS

Street conflicts

DAMON'S
McCARTHY

Intersection conflicts

CONFLICTS

of total travel time. The roadway width on West 35th Street does not provide sufficient room for traffic to bypass a vehicle if the curb lanes are utilized. Consequently, double parking on West 35th Street is rare and the duration is short. During one day of surveys, a total of 20 vehicles were observed to double park for less than one minute. While the stop does not seem substantial, the impact on the flow of traffic is significant, as Table IV-1 indicates.

Pedestrian and handcart volumes, per se, did not result in significant stop times. However, the movement of people and handcarts does force vehicles to slow down. This delay is probably reflected in the high frictional delay times noted in Table IV-1.

Frictional delays are delays whose cause could not be attributed to any of the four categories listed in the table. Generally these delay factors resulted in a slowing down of the traffic stream rather than actual stops. These frictional delays account for 25 to 42 percent of total trip time.

Further analysis of the traffic data for the sample blocks showed:

- that travel speeds in the Garment Center vary with time of day and thoroughfare traversed; the slowest speeds occur during the mid-day period; travel speeds on the streets are much slower than the avenues; travel speeds on the Core streets are slower than on the outer streets.
- that unlike automobiles and taxis, whose volumes peak between 8 and 9 in the morning and 5 and 6 in the evening, trucks and vans peak at 2 and 3 in the afternoon.

- that the average parking duration for motor vehicles was 1.54 hours; higher on the streets than on the avenues.
- the proportion of vehicles parked for four or more hours was 7%; however, they occupied 24% of the available space, (the legal parking limit is four hours).
- trucks accounted for 44% of space hours occupied. Vans, automobiles and other vehicle types accounted for the remainder.
- that 60% of the trucks are parked within the Core area.
- that movement of handcarts was noticeably impeded by: boxes and rolls of material stacked on the sidewalks, idle handcarts, pedestrians, and the loading and unloading activities of trucks.
- that sidewalk travel is slowest on the avenues for all types of movement, primarily because of the heavy pedestrian volumes and conflicts with vehicles turning at intersections.

The high volumes of traffic, the many trucks, and the low travel speeds are some of the problems that must be dealt with in attempting a pick-up or delivery in the area. Once within the Garment Center, the average trucker is faced with the problem of inadequate and insufficient loading facilities. The lack of adequate off-street parking facilities forces vehicles to park and unload at the curbsides. Thus, once on the district's sidewalks, goods movement activity impinges on pedestrian flow-to their mutual deterrence.

IV.3 Delivery Characteristics

It can often take a week for the Postal Service to move a letter from one part of a city to another. Traffic congestion can be responsible for only a small part of the total delays.

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IV.3 Delivery Characteristics

It can often take a week for the Postal Service to move a letter from one part of a city to another. Traffic congestion can be responsible for only a small part of the total delays.

The bulk of lost time occurs in the processing areas, at loading areas or at terminals.

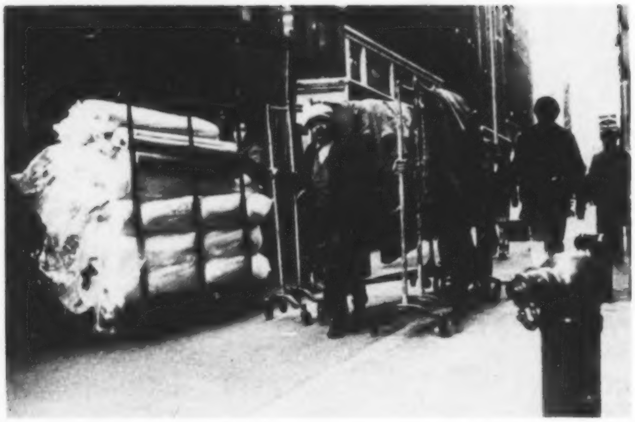
Similarly with goods movement in the Garment Center, the bulk of the delays are not caused by street traffic congestion. It is the slow goods movement process within buildings and at loading facilities, that leads to long parking durations, high curb occupancy, double parking, and frictional delays with moving traffic.

This section will more closely examine the goods movement process, once a truck has reached the curb and unloading begins.

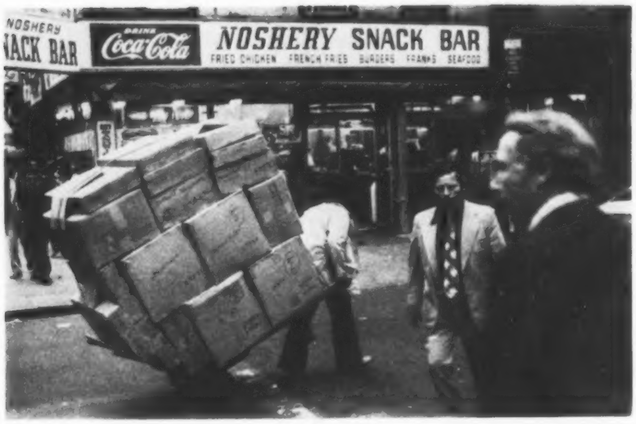
During a typical weekday, it is estimated that over 19,000 vehicles park curbside within the Garment Center for the period between 8:30 a.m. to 6:30 p.m. Forty-five percent of these vehicles were classified as intermediate or heavy trucks and twenty-five percent were vans. It was further estimated that 85% of the trucks (7150) and 65% of the vans (2980) were apparel-related.

The average amount of time spent at the curb varies with vehicle type. In the Garment Center Core, automobiles averaged about 30 minutes at the curb while 3-axle trucks averaged about two hours. Intermediate trucks, the most prevalent vehicle type, were parked on the average for almost 80 minutes.

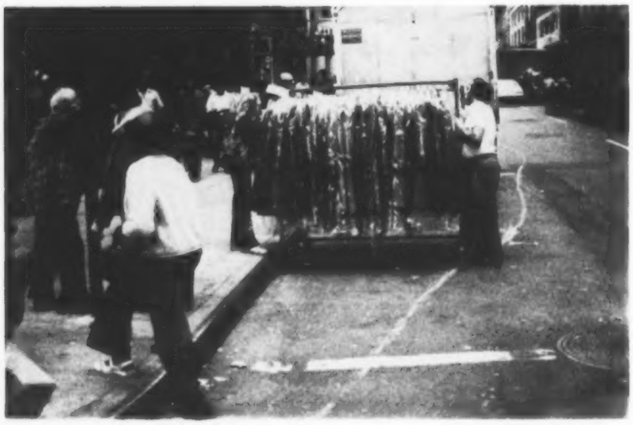
The activity level of each vehicle was recorded to determine a general measure of how efficiently the time spent



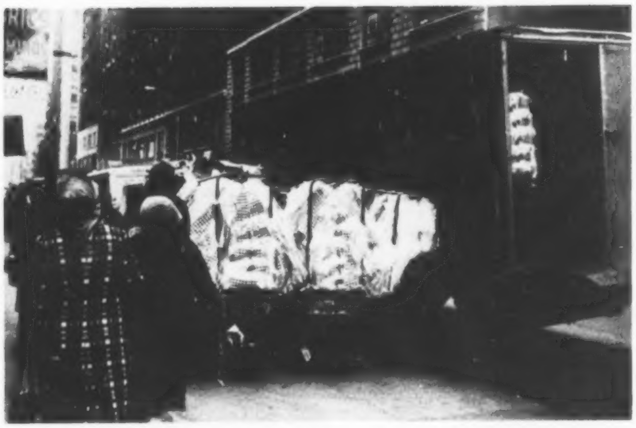
Rolls of piece goods


NOSHERY
NACK BAR
DRINK Coca-Cola
NOSHERY SNACK BAR
FRIED CHICKEN FRENCH FRIES BURGERS FRANKS SEAFOOD

Boxed goods



Hanging goods



Finished goods

HANDCART TYPES

parked was used. It was noted that loading and unloading activity occurred 29% of the time that a truck or van was observed. Activity increased with vehicle size; ranging from 3% for automobiles to 48% for heavy trucks.

The principal means of moving goods to and from vehicles and apparel firms is the handcart. Table IV-2 depicts trip characteristics and duration by type of trip generator. The top half indicates the characteristics of a trip. A trip segment is defined as travel from one point to another; thus a round trip consists of two segments. The lower portion of the table divides trip time by component. Administrative time represents time spent on tasks, such as obtaining proper documentation or receiving final instructions. The table shows that:

- handcart trips are usually from one point to another with no intermediate stop areas. A round trip has two segments.
- travel distances range from 1/20 to 1/2 a mile.
- separate trips are performed for pick-ups and deliveries which means that handcarts are usually empty for one leg of the trip.
- truckmen's round trip time is approximately 1/3 of average truck parking time.
- apparel company pushboys spend the longest time on a round trip; U.P.S. spends the least.
- the largest portion of trip time is travel time for most handcart generators. For U.P.S., it is elevator time because of multi-firm pick-ups and deliveries.
- waiting time is low for U.P.S. because of the distinctiveness of their uniforms and its familiarity to customers.

Table IV-2

Handcart Trip Characteristics

GENERAL CHARACTERISTICS

Handcart Trip Origination	Trip Segments	Handcarts	Push Boys	Round Trip Distance (feet)	Round Trip Time (minutes)	Percent of Trips With Both Pick-up and Delivery Activity	Average Rate of Travel (ft. per min.)
Apparel Company	2.54	.88	1.26	2,390	50.4	-	2.1
Truck Store, Freight Hall	2.13	1.59	1.61	1,885	35.8	8.7%	2.5
Local Truckman	2.08	1.52	1.56	1,105	26.9	8.3%	2.75
UPS	3.24	.81	1.00	260	29.3	20.0%	0.8

TRIP COMPONENT CHARACTERISTICS

Handcart Trip Origination	Obtain Load (minutes)	Administrative Time (minutes)	Travel Time (minutes)	Time In Elevator Queues (minutes)	Elevator Travel Time (minutes)	Waiting Time To Be Received (minutes)	Unload Time (minutes)
Apparel Company	7.6	7.2	17.7	5.3	2.2	8.3	2.1
Truck Store, Freight Hall	7.1	2.6	12.7	5.0	1.2	3.6	3.5
Local Truckman	6.9	2.1	6.7	3.5	2.9	1.2	3.6
UPS	6.4	2.9	5.1	6.9	2.4	1.0	4.6

Surveys have shown that trip times increase almost proportionately with the shipment's size: this occurs when truckers, unable to off-load their entire consignment at a loading dock at one time, must deliver their goods on a piece-meal basis. Conceivably, a truckman and helper with ten racks of hanging garments to deliver, would require five trips to complete the delivery - a task which could take as long as two and one-half hours, (5 trips x 27 minutes per trip). Thus the periods of vehicle inactivity observed could represent the time spent by a trucker and his helper in making pick-ups and deliveries.

IV.4 Trucking Stores

Trucking stores, ground floor storefronts rented by one or several firms and used as temporary storage facilities, were developed by the truckers as a way of reducing the time a truck is inactive. As previously noted, an average truck is inactive for 2/3 of the time it is parked.

Trucking stores operate in the following manner. Goods from apparel firms are picked up by the trucker's runners and stored in these areas until the arrival of the transport firm's trucks. Goods destined for the Garment Center are off-loaded, while goods bound for other areas of the region are loaded on the truck. The vehicle leaves and runners distribute the off-loaded goods to the district's firms. Thus, the trucking stores reduce the amount of curb space that would have been otherwise occupied.

Table IV-3

LOCATION OF FREIGHT FACILITIES BY TYPE OF FIRM

Street/Avenue		5th to 6th	6th to 7th	7th to 8th	8th to 9th	9th to 10th
W 41st	Local Truckmen					
	Line Haul					
	Air Freight					
	% Apparel (1)	0%	4%	0%	0%	0%
W 40th	Local Truckmen					
	Line Haul					
	Air Freight					
	% Apparel (1)	8%	4%	33%	0%	0%
W 39th	Local Truckmen					
	Line Haul					
	Air Freight				1	
	% Apparel (1)	35%	45%	81%	58%	0%
W 38th	Local Truckmen	2	1	2	8	1
	Line Haul					
	Air Freight	1			1	
	% Apparel (1)	28%	70%	70%	64%	0%
W 37th	Local Truckmen		3	6	8	
	Line Haul		3		2	
	Air Freight					
	% Apparel (1)	16%	75%	81%	58%	0%
W 36th	Local Truckmen		3	10	5	
	Line Haul			1		
	Air Freight				6	
	% Apparel (1)	28%	61%	71%	49%	0%
W 35th	Local Truckmen		2	5	6	1
	Line Haul		1	1		
	Air Freight					
	% Apparel (1)	29%	41%	69%	33%	0%

(1) Percent of employees on block classified as working for apparel firms

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Surveys indicate that the average round trip distance to a destination from a trucking store is 1885 feet, approximately 1/3 of a mile. It takes 36 minutes to perform either a pick-up and/or a delivery.

By conducting operations from a storefront facility, truckers can unload vehicles faster, however there are additional costs. These stores require the employment of additional workers and the use of handcarts for longer durations and distances because a trucker's customers are not usually concentrated around the trucking store.

In addition to providing pick-up and delivery service to the area's manufacturers, these store facilities serve as receiving stations for many of the nation's leading chain stores. In this capacity, the local carrier will receive shipments of hanging garments from the district's various vendors and consolidate them for delivery to a designated chain store warehouse located either in the Garment Center or in another area of the region. Transportation on racks is extremely advantageous to the chain store in that the need for packing is eliminated and labor and material requirements are reduced. Also, congestion within the warehouse is reduced. An additional benefit is the elimination of the need for unpacking, stowage pressing, and the additional labor required at the retail store level. The local carrier's transportation charges are usually based on a predetermined rate set under contract. The procedures involved are similar to those employed by contract carriers.

Besides trucking stores, there are other freight facilities in the area. Some firms will operate out of freight halls, the hallway between a building's freight entrance and the freight elevator. Others rent a small cubicle, where a telephone is attached: this room is used as a dispatching office. The United States Postal Service has a facility on West 38th Street: one of the few with off-street parking facilities.

Many transportation firms use their trucks as freight consolidation centers rather than renting storefronts. Small, one and two truck firms, perform their pick-ups and deliveries directly from the truck. They can not afford to own and maintain a street level consolidation center. The major package goods carriers also use trucks as sidewalk terminals. These firms do not require the services of their vehicles during the day so there is no opportunity loss in not using the vehicles. By using trucks as terminals, the costs incurred in renting and manning street level facilities are avoided.

Table IV-3 shows that the trucking stores, which serve as mini-consolidation centers, are concentrated between Sixth and Ninth Avenues, as are the apparel manufacturing firms. It is not uncommon for a trucking firm to maintain several storefront locations throughout the district.

In summary, the Garment Center faces multiple transportation problems. Traffic volumes in the area are high - 185,000 vehicles traverse the district daily; the speeds are low - less than 7 m.p.h. Concurrently, the garment assembly process requires the services of many trucks and handcarts. The average truck spends nearly 80 minutes parked at the curbsides. The lack of adequate loading and unloading bays and long delivery times render trucks inactive approximately 2/3 of the time. It takes approximately 30 minutes to complete a round trip delivery by handcart. The average distance covered is almost 1/3 of a mile.

An important insight into the delivery process can be gained by comparing identical deliveries to a firm in a multi-story loft building in the Garment Center with a delivery to a firm in the suburbs with a loading dock. If a shipment were comprised of 10 handcart loads of goods, the truck in the suburbs could probably be unloaded in 15 minutes. In the Garment Center this same shipment would require ten fifteen minute walking trips, totalling 2.5 hours, between the parked truck and the consignees premises. This high unloading time leads to slower goods movement, longer curbside occupancy times and reduced productivity in the Garment Center.

Chapter IV - Footnotes

1. Mid-day speeds tend to be about 50% lower than the average for the day. Also, speeds tend to decline as one approaches the Core of the district.
2. Total delay time equals 100.0 percent minus Sunday optimum trip time as a percent of total trip time.
3. Frictional delay time is defined as total delay time less Sunday optimum trip time less identified delay times.

V. The Monetary Costs of Goods Movement

The costs of the present goods movement system can be categorized into three areas: transportation costs, public costs and the cost of lost sales. Transportation costs may be reflected directly in the trucking company's bill or hidden in the price of supplies. The evaluation of the external public costs, constituting the environmental effort of the study, will be discussed in the next chapter. The identification of lost sales due to late deliveries proved to be the most difficult of the three types of costs to quantify.

To estimate the transportation costs involved in the garment assembly process, it is necessary to evaluate the direct and indirect costs incurred. Direct costs are those costs paid directly by the jobber and manufacturer, e.g., charges for the delivery of piece goods from beyond the Commercial Zone and the local truckman's, UPS's and Parcel Post's handling of shipped goods. Indirect transportation costs are those costs included in the price of the product or service purchased which are not charged separately. Included in this category are items such as the costs of delivering trim and shipping supplies to the firm, the round trip transportation costs of goods to and from contractors, and the use of jobber's pushboys for the delivery of shipped goods to retailers.

Table V-1 provides estimates of direct and indirect transportation costs for apparel firms by product line. As indicated in the table, transportation costs vary from $.29 per garment in children's wear to $1.17 per unit in coats and suits. The division between direct and indirect costs is also shown in Table V-1. Transportation costs as a percent of annual sales range from 2.0 to 3.4 percent of annual sales. Total transportation costs of Garment Center firms are from 2.7 to 3.9 times higher on a percentage basis than for the typical apparel firm in the United States.

This differential in costs results from the additional transportation costs incurred by New York City jobbers in the handling of cut goods, finished goods, and shipped goods; costs not typically incurred by other apparel firms who perform their manufacturing in-house.

Thus, the Garment Center firms pay a premium in transportation costs that ranges from $.20 to $.36 per garment.(1) The indirect costs, the portion of transportation costs due to lengthy parking duration, long handcart trips, frequent small deliveries, and the Garment Area Pick-Up and Delivery Charge, are mainly responsible for the differential in transportation costs between Garment Center firms and other apparel firms.

The total annual transportation bill for the sportswear, dresses, coats and suits, and children's wear firms of the

Table V-1

TRANSPORTATION COSTS FOR GARMENT CENTER FIRMS

		SPORTSWEAR	DRESSES	COATS & SUITS	CHILDREN'S WEAR
1)	ANNUAL UNITS SHIPPED PER FIRM	392,400	184,300	44,500	340,500
2)	AVERAGE WHOLESALE VALUE	$10.65	$25.55	$60.20	$14.60
3)	AVERAGE ANNUAL TRANSPORATION COSTS PER FIRM	140,289	107,710	52,078	99,050
4)	TOTAL TRANSPORT COSTS PER UNIT	.357	.584	1.170	.290
	Direct Costs	.147	.247	.506	.086
	Indirect Costs	.210	.337	.664	.204
5)	PERCENT OF ANNUAL SALES (1)	3.36%	2.29%	1.94%	1.99%
6)	1973 TRANSPORTATION COSTS AS PERCENTAGE OF SALES, INDUSTRY AVERAGE (2)	0.83%	0.84%	---- (3)	0.55%
7)	RATIO OF GARMENT CENTER FIRM COSTS TO INDUSTRY COSTS	+3.9	+2.7	---- (3)	+2.8
8)	TRANSPORTATION COST PREMIUM PER UNIT FOR GARMENT CENTER FIRM	$ .26	$ .36	---- (3)	$ .20

(1) Transport costs divided by average wholesale value.

(2) 1973 Financial and Operating Report, American Apparel Manufacturer's Association.

(3) Data not available.

area is estimated at over $130 million.

One component of transportation costs for the area's firms is the Garment Area Pick-up and Delivery Charge. Interstate shipments picked-up or delivered in the Garment Center are subject to this additional surcharge. The surcharge was established to compensate carriers for the high costs of operating in the area that result from the delays caused by traffic congestion. The ICC carrier collects the total freight charge including the surcharge owed by the consignee. The local truckman, delivering the shipments within the Garment Center area, is then compensated by the ICC carrier.

The association of carriers from each major region levies its own rate for Garment Center shipments. A typical charge for deliveries to the study area is $1.15 per hundred weight; this is approximately 40¢ more than the charge levied on deliveries to other Manhattan locations.(2)

The surcharge is associated primarily with piece goods delivery. The area's apparel firms pay an estimated $7 million annually in surcharges. On a per firm basis, the annual charges range from $2,600 for a typical coats and suits firm to $7,500 for a sportswear company.

In addition to these identifiable transportation costs, there are transportation costs that are reflected in the general costs of the firm but which were not isolated. Two of the most important are security-related expenditure and sales lost due to inadequate transportation.

As has previously been noted, the apparel flow process is an involved one where many firms and individuals handle the product before the final shipment. Maintainence of the security of the goods in transit is thus a problem. Three security-related areas are thefts, theft-reducing measures, and insurance. Each will be examined separately.

Currently, there is a lack of readily accessible information on theft and related activities.(2) However it has been estimated that, on a national basis, theft losses and shortages of apparel in 1971 were at least $15,000,000. The above does not include losses incurred by class II and III carriers and 50 percent of class I carriers filing with the I.C.C. The Garment Center probably accounts for almost half of these losses.(3) Furthermore, in 1972, there were 130 hijackings of apparel trucks in New York City.(4) These instances relate only to reported hijackings that occurred for shipments valued at more than $10,000 and where threat of force was involved.

The many handlings of goods in transit, make cargo security a problem. To discourage thefts various anti-theft procedures has been instituted. Entry to apparel plants is closely controlled by locks and alarms; all items shipped are counted by both parties upon receipt as well as pick-up; two persons are usually used to transport a handcart. Various anti-theft devices such as hidden locks, alarms, and ignition cut-off switches are installed on garment trucks. Exact figures on costs are not available because of a lack of adequate record keeping.

Insurance problems in the area abound. Operations in the area are such that some carriers are unable to obtain an insurance at all. Most carriers provide minimal liability against loss, that is, $50 per shipment and a $1.00 per garment. Shipper insurance coverage is of the deductible type with the level of deductible fluctuating among the firms. Because of the deductible and fear of higher rates many losses are not reported. In this area too firms statistics are hard to obtain.

An effort to estimate the volume of sales lost in the district due to the area's transportation proved unsuccessful. This may be due to the area's transportation system having evolved into one that stresses service rather than efficiency.

Potential Cost Reductions

The combined annual transportation cost to the sportswear, dresses, coats and children's wear firms was estimated previously to be $130,325,000. Included in the transportation cost is the freight surcharge for Garment Center receipts associated primarily with piece goods receipts. The preliminary estimated annual surcharge is $6,900,000 which ranges on an annual basis from $2,570 for a typical coat and suit firm to $7,480 for a typical sportswear firm.

Within this section, an initial attempt will be made to estimate the effect on transportation cost if:

- Truck travel rate is increased within Garment Center
- Truck parking proximity is improved

- Long handcart trips for the local truckmen are reduced in length, hence duration
- Elevator waiting time is reduced

During a typical week day, about 19,120 vehicles parked curbside within the Garment Center during the 10 hour period from 8:30 a.m. to 6:30 p.m. It was further estimated that 44% of the parked vehicles were intermediate or heavier trucks and 24% were vans. For purposes of initial estimation, assume that 85% of the trucks (7,150) and 65% of the vans (2,980) were apparel related. The travel rate (including delays) observed during the day average 5.7 mph on the streets and 10.5 mph on the avenues.(7) The typical vehicle travels 0.6 (7) miles within the Garment Center averaging 6.75 mph requiring 5.33 minutes. Then, for every 10% increase in travel rate that is realized as a result of the short range traffic improvement alternatives recommended during the first year's study effort, the estimated annual cost reduction to the apparel related trucks and vans would be:

ESTIMATED ANNUAL COST REDUCTION WITH INCREASED TRUCK AND VAN TRAVEL SPEED

	10% Increase	25% Increase
Trucks	$415,000	$1,038,000
Vans	86,500	216,000
Total	$501,500	$1,254,000

Truck and driver costs shown in reference (6) were used to estimate cost reduction. It was assumed above that a helper or "pushboy" would accompany the driver.

During the truck parking proximity and observation studies that measured the distance between the parked vehicle and freight entrance, parking duration and activity the following were noted:

	Trucks	Vans
Average Observed Distance Between Parked Truck and Freight Entrance	110'	110'
Average Parking Duration(7)	79(8) min.	53 min.
Activity - Pervent Occurrence		
- Unattended	52%	70%
- Attended	18%	12%
- Loading/Unloading	30%	18%

If the unattended truck time was reduced 25% as a result of using the truck less as a means of "reserving" a space, the estimated annual reduction in truck and driver cost (provided the driver is not used for other productive work while the truck is idle) is:

Truck Cost Reduction	$2,940,000
Van Cost Reduction	1,008,000
Total Cost Reduction if Decreased Unattended Time 25%	$[illegible],948,000

Additionally, if the truck could park 50% closer to the freight entrance, the table below shows the estimated pushboy labor savings if two handcart trips are assumed for the van and ten handcart trips for the intermediate truck. The truck cost reduction reflects an estimated 25% reduction in the truck loading/unloading time.

ESTIMATED ANNUAL COST REDUCTION WITH IMPROVED
PARKING PROXIMITY, DECREASED UNATTENDED TRUCK TIME

	Pushboy	Vehicle (9)
Trucks	$943,800	$2,459,000
Vans	78,700	387,000
Total	$1,022,500	$2,846,000

The graphic micro model included in this report illustrated the typical round trip pushboy walking distances involved in the transfer of apparel products between the local truckman's facility (truck or storefront terminal) and the apparel firms or supplier. If the long trips were reduced to the equivalent length of UPS's round trips, the estimated cost reduction would exceed $2,250,000 based on pushboy savings. The cost reduction would be possible if the local truckmen were able to concentrate their "customers" in close proximity to their service facilities. It is also estimated that if the truckmen's customers were in the same or adjacent buildings to the freight facilities, pushboy trips could be better scheduled to reduce the amount of time spent in elevator queues. If the time spent in elevator queues was reduced by 25%, the estimated annual cost reduction to the local truckman could exceed $375,000.

The potential cost reduction, service improvement possibilities were presented to illustrate the significant different improvement alternatives could have on the Garment Center. The cost reduction possibilities should be treated as preliminary but conservative estimates which can be further developed in detail during Phase II study effort. The total reductions of $11,695,000 amounted to 9% of the annual transportation costs.

Chapter V - Footnotes

1. The net advantage or disadvantages of locating in the Garment Center cannot be evaluated without examing all cost components involved in the process of producing, shipping, and selling apparel goods.

2. Southern Motor Carrier Rate Conference, Tariff number 14-u.

3. New York City Police Department, "Garment Center Study an Interim Report", Cargo Security Project, 1975.

4. ibid p.6-7

5. New York City Police Department, Safe, Loft, and Truck Squad.

6. The hourly cost estimates utilized are as follows:

   Cost of Leased Truck - $4.27
   Cost of Van - 3.41
   Cost of Driver (including fringe) - 5.34
   Cost of Helper (includes fringe) - 4.32

7. Edwards and Kelcey

8. Includes intermediate and heavy trucks.

9. Includes driver and helper.

VI. Public Costs of Goods Movement

This chapter discusses the external costs borne by those working in and frequenting the district, but which are usually not reflected in the prices charged to the purchaser. The major categories of hidden public costs include air and noise pollution and personal and property accidents. The magnitude of these environmental costs must be considered in the evaluation of improvements. The socio economic impact of the impact of the goods movement system is identified and discussed.

VI. Air Quality

Air quality measurements were taken at thirteen sites located throughout the district. The 1-hour National Ambient Air Quality Standards for carbon monoxide of 35 ppm (parts per million) were exceeded only three times out of 956 hours of observation. The 8-hour standard of 9 ppm was exceeded on 60 of the 72 days during which 8-hour concentrations were determined. In addition, on 20 of these 60 days, the 8-hour standard was exceeded by 100% or more. Violations of this standard occurred at all sites except those along Sixth Avenue. It is anticiapted that continuous air quality monitoring of all the sites would have shown CO levels exceeding those permissable under the 8-hour standard.

The air quality measurements were combined with volume, mileage, and speed data to obtain estimates of emissions for 1973 and 1976 vehicle type. Trucks were found to be responsible for over 50% of emissions, while taxis accounted for an additional 15%.

To meet National Ambient Air Quality Standards, 1973 carbon monoxide emission levels (estimated at 1,399 lbs. per day) would have to be reduced by 73 percent by December 31, 1976. Vehicle turnover strategy, the replacement of older more polluting vehicles by newer and cleaner ones, will reduce emissions by 14%. The implementation of automobile, taxi, and truck inspection strategies in New York City should reduce emissions by an additional 39%. However, an additional 281 pounds of CO must be eliminated to achieve mandated levels. Thus, additional transportation controls, such as the banning of automobiles and the introduction of new vehicle types, have to be implemented. Since these controls will have to be severe, careful planning is needed so as to place the burden on those types of vehicles that can best afford to and can most easily adjust to restrictions.

This study has estimated the 1973 health costs of air pollution in the Garment Center to have been $177 per capita. Between 96,000 and 116,000 persons appear to be exposed to CO emissions in the area so that the total costs of air pollution lie in the range of $17.0 million to $20.5 million. Since about half of the emissions are due to trucks, it can be stated that truck activity is responsible for between $8.5 million to $10.2 million in health costs. It has been estimated that a one percent reduction in vehicular activity, say automobiles, will yield health savings of between $113,000 and $136,000.(1)

These figures are based on estimates developed by William R.Ahern Jr.(2) in a national study. Ahern's methodology consisted of the following steps:

1. Determine the automobile's contribution to concentration levels:

   The author assumes that the automobile's contribution is the same as its percentage contribution to carbon monoxide emissions.

2. Determine the effect of various reductions in automobile emissions on pollutant concentrations:

   The percentage of time that concentrations exceeded the national standard was determined under the assumption that lower levels do not affect health adversely. It was assumed that ambient concentrations are reduced by the same percentage as the level of emissions was reduced.

3. Estimate the population exposed:

4. Determine the damage to health of exposure to pollutant concentrations:

   This step disaggregates the population into chronic, acute, and healthy categories of susceptibility to health conditions; develops a common measuring rod for estimating the damage to health;(3) surveys a panel of medical experts to determine the effects of exposure on health; and aggregates the amounts of damage reduction for different levels of emissions reductions.

5. Estimate the monetary value of damage reductions.

In summary, the 8-hour emission standards of the 1973 Ambient Air Quality Standards are exceeded 83 percent of the time. The normal replacement of vehicles and the implementation of additional vehicle inspection programs will reduce emission by over 50 percent. An additional 20 percent reduction in emissions will be necessary, if Federally-mandated standards are to be met by 1976. Various transportation control policies are available to reduce the emissions level. The cost of air pollution in the Garment Center, $177 per capita, should be considered in deciding which policy to implement.

VI.2 Noise Levels

Ambient noise levels in the Garment Center were also measured as part of the environmental study. Throughout the report, dBA measurements are used; that is, sound levels represented in decibel form and adjusted according to the commonly accepted A-weighting network. Because of the large range of hearing intensity, a logarithmic compressed scale, dB, is used to measure sound. An increase in noise from 100 dB to 110 dB is not a 10% increase, but rather a 10 fold increase in sound energy. The A-weighted decibel scale, dBA, is utilized because it deemphasizes very low and very high pitched sounds as does the ear. The dBA scale provides a good one-number indication of how loud a noise seems to people. For example, a quiet residential area at night will have a reading of approximately 40dBA. The noise inside a subway car will be about 90 dBA, while a jet takeoff is almost 120 dBA.

Noise levels were measured by taking five minute recordings at various sites in the district. These samples were taken at mid-block as well as intersection sites on avenues and crosstown streets. Average sound levels on the avenues were L_{10}=79 dBA, L_{50}=73 dBA, and L_{90}=69 dBA.(4) On crossstreets the readings were 74 dBA, 69 dBA, and 66 dBA, respectively. There appears to be no marked difference in noise levels between the core of the Garment Center and the areas that surround it.

Different vehicle types contribute in varying degrees to noise levels. An analysis of traffic data indicates that trucks contribute proportionately more to noise levels than either vans or automobiles. In the aggregate, however, noise levels do not seem to change. Differences in traffic volumes do not appear to alter noise levels significantly. A halving of daytime traffic volumes will lead to a reduction of 1 or 2 dBA in the L_{10} measurement; a reduction that is not considered significant. It thus appears that current noise levels can not be appreciably altered.

VI.3 Accidents

The impact of traffic patterns and volumes on accidents and their costs were also evaluated. There were over 500 reported accidents in the Garment Center in 1973; 310 were property damage only (PDO) accidents, 228 accidents involved some injuries, and there was one fatality. The total cost of these accidents was placed at approximately $900,000. This estimated cost figure included medical and legal fees, the value of the property damaged, and the value of lost time and lost future earnings.

An analysis of accidents suggests that congestion caused by automobiles and taxis has a major effect on the frequency and severity of accidents. Automobiles and taxis, rather than trucks, are responsible for a major portion of the accident cost. Although pedestrian volumes appear to affect vehicle travel speeds and turning movements, it would seem that the level of pedestrian activities has relatively little impact on the frequency of accidents as a whole.

In summary, the external costs, borne by those in the Garment Center, consist mainly of air and noise pollution and accident costs. Air quality in the area is rather poor; Federally-mandated 8-hour standards were exceeded 83 percent of the time. Excessive readings were noted throughout the area.

Noise level readings were high. L_{50} readings on streets averaged 69 dBa on avenues it was 73 dBa. There were no marked differences across locations.

Over 500 accidents were reported in the area. Their total cost was placed at approximately $900,000. Automobiles and taxis, not trucks, are major contributors to the frequency and severity of accidents.

VI.4 Socio Economic

Cities have traditionally been centers of opportunity for upward social mobility of low skilled workers. Urban manufacturing has provided employment for imigrants from other countries or from rural areas, while their children acquired skills in the public and trade schools. Although these urban manufacturing jobs might pay low hourly wages, through long hours, an employee could earn enough money to establish a stable family and maintain self respect by being able to provide for his own family. Cities have been fulfilling this national need of providing opportunity for low skilled workers for several hundred years.

Cities have also promoted the generation of many new ideas and technologies. The external economies provided by cities provide the conditions such as reduced capital requirements necessary for an entrepeneur or small firm to develop and promote new products. It has been demonstrated many times that small firms are more receptive to new ideas, than the large companies, which can function outside urban centers. This generation of new products has been an important source of the nation's economic growth.

In the last twenty year's manufacturing and the associated blue collar employment have been declining in many urban centers. No new mechanism has been developed to adequately replace urban manufacturing in providing these economic opportunities.

There are several reasons for the decline of urban manufacturing, one of them is the restrictions of the urban goods movement system. One objective of this study was to develop improvement to the urban goods movement system which would support the role of cities as centers of economic opportunity.

The socio economic costs identified in this section were not quantified in this study. This would have been a major task peripheral to the main intent of the work program. In discussions of the urban goods movement problem there already exists enough quantifiable costs to provide a basis for decision making. The magnitude of the socio economic impacts may be larger than these costs, however, at this stage of development of urban goods movement planning process the mere identification of these impacts is a significant contribution.

CHAPTER VI - FOOTNOTES

1. Assume that a one percent reduction in emissions will avoid two percent of per capita health costs.

2. Ahern, William R., "Measuring the Value of Emission Reductions," in Henry D. Jacoby and John D. Steinbruner, et.al., Clearing the Air, 1973.

3. This measuring rod is called the estimated day of restricted activity, ERDA. The ERDA is a measurement indicating the substantial reduction in normal activity of a person on a particular day due to a specific illness or injury. The type and the degree of this reduction varies with the individual's age and occupation. It was assumed that 50 hours of exposure to carbon monoxide levels exceeding the 8-hour federal standard will lead to one ERDA.

4. L_{10} indicates measured noise levels met or exceeded by 10 percent of the samples. L_{10} provides a useful measure of sustained high noise levels. L_{50} indicates measured noise levels met or exceeded by 50 percent of the samples. L_{50} gives a good idea of the noise levels a person can expect to encounter. L_{90} indicates the measured noise levels met or exceeded by 90 percent of the samples. L_{90} provides a measure of background, or ambient, noise levels.

VII. Methodology

Only a few comprehensive studies of the urban goods movement process have been conducted. It is important that each study report on the methodology employed. Many of the procedures developed in Garment Center Study will find application in other urban goods movement studies.

Two major tasks of Phase I of the study were the development of a data base and the analysis of the data gathered. These were utilized to understand the goods movement system, identify problems, and provide information for evaluating alternate short-term improvements. Data on a district-wide as well as for four sample blocks was collected.

District-wide information was gathered on traffic flows in the street system, the pattern of land-use, the number of firms and their employees, the characteristics of apparel and trucking firms, and air and noise pollution levels. Detailed studies were also conducted on four sample blocks. Information gathered was used primarily to develop the average times of various segments of the goods movement process. Together, the district-wide and sample block data, were utilized in the development of a complete picture of the urban goods movement process in the Garment Center. An immense amount of data was collected, most of it could be concisely summarized with the macro and micro models discussed in chapter IV.

VIII.1 District-Wide Traffic Data

District-wide traffic data was collected to provide an insight into how the arterial system of the area was being utilized. Traditional data collection methods were employed. The general traffic data compiled for the entire Garment Center consisted of three basic types of information:

- Volume Data - The number of vehicles by vehicle type entering, leaving and traveling within the district was counted during the summer of 1973. The traffic volumes have been compiled by time-of-day and day-of-week. Information to identify monthly or seasonal traffic characteristics is being compiled as the study continues.

- Travel Data - The average travel time and delay time has been determined for vehicles along each roadway and roadway segment within the Garment Center during summer weekdays. Variations in travel speeds have been compiled by time-of-day, day-of-week and month. Measurements are continuing to identify seasonal variations throughout an entire year.

- Curbside Parking Data - The number of vehicles parked along the curbside of each block segment within the district has been measured during a typical summer weekday. The turnover, duration, and occupancy has been determined for curbside parking at each block face in the district.

This overview of traffic was used to define the traffic activity and concentration by vehicle type along all roadways within the Garment Center, to identify areas of travel congestion and delays, and to determine the magnitude of the usage of curbside parking facilities within the district.

Mechanical traffic counters and manual classification counts were employed throughout the Garment Center. Traffic volume information was compiled at each roadway crossing the Garment Center cordon, at selected locations within the district and at numerous intersections within the district. The cordon counts were compiled by Automatic Traffic Recorder (ATR) machine counts and manual classification counts. The selected control counts were compiled by ATR machine counts. The intersections were counted manually. The manual classification cordon counts were conducted from 7:00 A.M. to 7:00 P.M. for one weekday at each location during May, 1973. At each location, vehicles were classified as auto, taxi van, light truck (2 axle, four tire) by hour period. The ATR cordon counts were placed at each location for a one-week period during May to determine the hourly patterns for the 7:00 P.M. to 7:00 A.M. period not classified and to estimate daily variations at each location. The manual classification counts were expanded to the ATR twenty-four period and adjusted where necessary to portray an average weekday. Additional ATR machine counts at selected control locations within the district were conducted for a one-week period each month and used to determine daily and monthly variations of traffic within the district. The intersection counts were scheduled to obtain a morning hour, mid-day hour, and afternoon hour count at selected locations during the month of May. Vehicles were classified into the same categories defined for the cordon classification counts. The intersection counts have been used to develop flow volume and to assess capacities within the Garment Center.

Monthly speed and delay monitoring have been carried out as part of the study. This monitoring served two major functions. First, it permitted the relating of traffic activity to actual travel times, a more meaningful parameter. Second, it served as an indicator of the variation in the level of activity throughout the year. Initially test car travel time runs were performed during the summer months, May through August, to measure average travel times and delays along each roadway from Fifth Avenue to Tenth Avenue and from 35th Street to 41st Street. A minimum of 18 runs were performed along each roadway and the survey was designed to obtain at least six runs during the morning (8 to 9 A.M.), mid-day (11 A.M to 2 P.M.), and afternoon (3 to 6 P.M.)time periods. The driver attempted to proceed with the average flow of traffic during each run, and the day and date, location, time-of-start, time crossing each checkpoint (each intersection along streets and every second intersection along avenues), and the time, location and reason for each delay were recorded for each run.

To determine curbside space utilization, street surveys were conducted throughout the Garment Center. The parking survey was performed for all curbside parking within the district during May. Manual observations were recorded at one hour intervals from 8:30 A.M. to 6:30 P.M. on a typical weekday at each curbside parking space. Vehicles parked were identified by vehicle type and license plate number for each space on each tour. The data collected included the number of vehicles entering (in), leaving (out) and accumulated by vehicle type at each block curbside facility, the average duration by vehicle type at each curbside block face, and the curbside vehicle space hours occupied by vehicle type and block face.

VII.2 Land Use and Economic Data

The collection of land use data was a useful and neccessary means of identifying how the existing land is utilized. From this, concentrations of firms, which are centers for goods movement activity, were identified. This portion also helped to determine how strong various locational factors are to the industrialist. Factors such as building accessibility, rental rates, and physical location (the classic tradeoff between the lower cost of locating on a side street versus the higher cost and the greater exposure of a fashionable avenue address) were considered. Economic data such as the number of employees were also compiled on firms within the district. The primary source of this information was the Dun and Bradstreet Data obtained from the City Planning Department and the Mayor's Office of Apparel Industry and Planning.

The land use and economic data provided information such as the typical building type, building use, location of vacant land, occupancy rates, assessed valuation building bulk (floor area ratio), zoning, number of firms, employment, product produced (SIC Code), etc. These data provided an insight into the character of the Garment Center. In Phase II, the data will be used in the development of district-wide activity and trip generation models.

VII.3 Sample Blocks Data

Another element of the data collection program focused upon the operation of the goods movement system. This required a much more detailed set of observations; a microscale appraisal of the Garment Center's activity. Gathering detailed measurements of travel conflicts and delays and goods movement activities throughout the entire Manhattan Garment Center would require an effort well beyond the scope or needs of this study. As a result, a sample of representative blocks was selected for for detailed examination. They were:

..West 35th Street between 7th Avenue and 8th Avenue
..West 36th Street between Broadway and 7th Avenue
..West 37th Street between 7th Avenue and 8th Avenue
..7th Avenue between West 39th Street and West 37th Street

These sites were selected because they are typical of the area, and provide a cross-section of Garment Center manufacturing firms.

Measurements of traffic and goods movement activities were made on these sample blocks during the months of November and December, 1973. Follow-up surveys were conducted in March of 1974. The purpose of these follow-up surveys was two-fold. First, based upon industry sources, March was reported to be a peak activity month and measurements during intense activity periods are vital. Second, an attempt was made to verify the results of the November surveys. The results of the measurements along the sample block segments were related to activities within the entire Garment Center and were also used to identify and evaluate potential improvements.

The same basic data that were collected on a district-wide basis were collected on these block segments. In addition, detailed information was compiled by field surveys using a number of forms specifically designed for this study. The information collected consisted of the following items:

- Vehicle Classification Counts
- Parking Duration Measurements
- Commercial Vehicle Circulation
- Pedestrian and Handcart Observations
- Curbside Vehicle Activity Observations
- Handcart Activity Observation
- Elevator Observations
- Parking Proximity Observations
- Duration of Inbuilding Time

The TAD staff approached the truckers, manufacturers and building owners in order to solicit their cooperation during these surveys. Without the cooperation of the private sector, the data collection efforts would have been impossible. Whenever possible, all measurements were taken from 7:30 A.M. to 6:00 P.M. of the same day for each block segment. The forms used to collect the above information and a description of data collection procedures follows.

a. Vehicle Classification Counts (Form 1a, 1b)

This form was used for district-wide analysis of traffic volumes and mix. Surveys were taken continuously from 7:30 A.M. to 5:30 P.M. and included data on the number of vehicles, type, and time of day, as well as handcart volumes into and out of blocks.

b. Parking Duration Field Sheet (Form 2)

Data by vehicle type, state of registration and activity level of parked vehicles was manually collected. Observations were made on a 15 minute tour basis on the sample blocks; a 60 minute tour was used on the district-wide survey. The survey provided data on the number of vehicles entering and leaving curb spaces by time of day, duration of each vehicle parked, and number of vehicles accumulated. Thus the level of space utilization was ascertained.

c. Commercial Vehicle Circulation (Form 3)

Form 3 was developed to measure whether search for parking spots was prevalent. The vehicle type, license plate and state of registration of all commercial vehicles entering the sample blocks from 7:30 A.M. to dusk were noted. The data were collected in 5 minute blocks. Each license plate datum, including time and street identification, was key punched, stored on a magnetic disc file and processed to print out matched license plate pairs. The matched sets were analyzed to determine the time interval between the first and subsequent observations. Utilizing speed and delay data and turning vehicles observations, it was determined that vehicles returning to the study block within twenty minutes would be considered as circulating, i.e., searching for a suitable parking space. Vehicles returning after twenty minutes were assumed to be on a subsequent trip or just passing through.

d. Pedestrian and Handcart Observations (Form 4)

The effect of sidewalk congestion on pedestrian and handcart movement was evaluated by timing samples found within the sample blocks. A total of 906 samples were observed of which 470 were handcarts, 174 female pedestrians and 262 male pedestrians. Each sample was selected at random as it entered the study block. The point of entry, starting time, destination address, and time and sample type were recorded for each entry. Travel rate was determined by scaling the distance in feet between point of entry and the destination on a large scale map and dividing by the elapsed time in seconds. Records with incomplete destination data were excluded from the travel rate tabulations. Thus the form provides information on pedestrian and handcart travel speeds, by time of day, causes and durations of delays, and whether the sample blocks were origins or destinations.

e. Curbside Vehicle Observation (Form 5)

This form attempted to provide insights as to the basic truck loading and unloading techniques. Information gathered included vehicle characteristics, the availability and usage of materials handling equipment, the time spent loading and unloading, type of product, stage of completion, loading factors, and origin/destination address. This form proved to be one of the most complicated for the surveyor.

f. Handcart Activity Observation (Form 6)

The form was used to collect data on the trip patterns of handcarts. Samples were chosen randomly and followed for a complete trip, regardless of the number of stops during a trip. All of the handcart activity observations were made during the November-December 1973 and March 1974 street activity surveys for trips originating in the sample blocks selected for observation. The observer would follow the handcart "push boys" for a complete round trip consisting of two or more one-way trip segments. The trip distance was determinable from the building addresses recorded. Loading and unloading assistance was noted. Special care was taken to note the amount of time spent at each element of the trip. Sources of delay as well as points of origin, destination, and intermediate stops were noted. Results of this survey were of particular importance in the development of the microscale model.

g. Elevator Observations (Forms 7a, 7b, 7c)

A significant portion of goods movement in the Garment Center is vertical; elevators transport goods between the shipping and receiving rooms of firms located in multi-storied buildings and the street level. The collection of information on elevator utilization in buildings was done with this form. Background data was collected on the building and elevator characteristics (Form 7a). Due to the comprehensiveness of the data, two forms were required to collect information on elevator trips. Form 7b was a time and motion study of elevator movement, noting the queue lengths and type of loads. Form 7c focused on the actual load characteristics rather than times. These forms were used in selected buildings on the sample blocks.

Twenty-one buildings were observed in detail with at least five buildings per sample block during the November 1973 surveys. Data collectors rode the elevators continuously averaging 3.6 hours per building. Data collection activity was scheduled to equally observe morning, noon, and afternoon operations. Stop watches were utilized for accurate recording of elevator stop and travel durations. On-load and off-load travel activity was recorded each time the elevator stopped. The load on the elevator during each trip segment was recorded distinguishing between loaded and empty handcarts or persons. The queue awaiting service at each stop was recorded. The elevator conditions, capacities, dimensions, and speeds were also observed.

Eight of the original buildings were re-observed in March, 1974, a peak period. Buildings from each sample block were included. Data collection activity was scheduled so that the time of day of observation was the same as in November.

The results of this information were analyzed to determine fluctuation in activity by time of day, as well as by season. In addition, a multiple regression analysis was performed to determine the impact of economic and land-use variables on various measures of elevator efficiency, such as average queue length and average stop time. It was determined that the most important variables were:

a. Ratio of floors served per freight elevator

b. Total number of floors served

c. Elevator platform area

d. Number of apparel manufacturing employees per freight elevator

h. Parking Proximity Study (Form 8)

The purpose of this form was to gather data on how close to their origins/destinations the truckers could park. The observer randomly chose a truck and followed the pick-up/delivery to the building. The address where the truck was parked, the origin/destination address, and the product carried, were noted.

i. Duration of In-building Time (Form 9)

This form was used to obtain a large number of observations on the length of time spent by trucker's pushboys in making pick-ups and deliveries. A surveyor stationed at the freight entrance, noted some distinguishing characteristics of pushboys entering the building, the time of entry and time of exit. A comparison of the two times would yield in-building time.

The Parking Proximity and Duration of In-Building Time surveys, forms 8 and 9, proved to be very effective. The results corresponded rather closely with information developed in other surveys while requiring fewer manhours. Thus, these forms can be used as a rapid and relatively inexpensive way of pinpointing potentially serious bottlenecks in the goods movement process.

These forms were utilized to measure selected portions of the total activity on the sample blocks. The totality of activities, the effect of spatially separated causes and the interactions of several events are some factors that could not be measured piecemeal. Time-lapse photography was employed in an attempt to capture a broader view of street activity.

For the time-lapse photography survey, an eight millimeter movie camera with an intervalometer was used to record the traffic activities along each block segment and at each downstream intersection of each block segment. A vantage point was located for each segment and intersection which provided an unobstructed view of traffic activities. The roof or ledge of a building was generally used for each block segment and a truck with a lift platform was used for filming traffic activities at each intersection.

A time interval of two seconds per frame was used for block segment measurements, providing two hours of continuous film for a 50 foot real. Each block segment was filmed from 8:30 A.M. to 5:00 P.M. Each intersection was filmed from 9:00 A.M. to 4:00 P.M., using a time interval of one second per frame which provided one full hour of continuous film. A total of 800 feet of film, representing 32 hours of field measurements, was obtained for the four block segments and 1200 feet of film, representing 24 hours of field measurements, was obtained for the four intersections. Time-lapse photography was also used to supplement and confirm manual classification counts and to observe the general flow of traffic and identify unusual occurrences along the sample block segments.

Time-lapse photography was used to measure travel times, identify conflicts and measure delays along each block segment and at the downstream intersections of each segment. Double-parked vehicles and vehicles not stopping along the block segment were also identified by time-lapse photography surveys. All other activities were conducted by manual observations. Double-parked vehicles were recorded by a continuous count projecting the film at a high speed, 16 to 24 frames per second. Vehicles traveling through the block without parking were identified by selecting every 30th frame (one minute of real time resulting in 60 samples per hour) and tracking each sample vehicle as it entered the block by projecting the film at a high speed to record whether the vehicle parked or passed through the block without stopping. The travel time and delays along each block segment were identified by selecting every 180th frame (six minutes of real time resulting in 10 samples per hour)and tracking the first sample vehicle passing through the block to record the time (frame numbers) and identifying the cause of each stop delay enroute. At intersections, the travel times and delays were identified by projecting the film separately for traffic approaching from the street. Every 90th frame (1.5 minutes real time resulting in 40 samples per hour) was selected for tracking vehicles at each approach to each intersection. The time-lapse photography was then summarized for four separate categories; double-parked vehicles, vehicles passing through without parking, travel and conflicts along block segments, and travel and conflicts within intersections.

The field surveys provided information on the different elements of the goods movement distribution system. In addition the amount of time required for various segments of the goods movement process were measured. These data, coupled with the land use and economic data, were used in the construction of the micro and macro scale models of goods flow activity. From these models, the activity on any block segment and for the entire district can be estimated. In addition to the detailed field survey data and time-lapse photography, other important sources of data have been the files of the cooperating agencies and groups. The assistance of the United States Department of Transportation, United States Environmental Protection Agency, Mayor's Office of Apparel Industry Planning and Development, City Planning Department, Department of Air Resources, and the Economic Development Administration has been invaluable during Phase I of the project.

VII.4 Economic Structure of The Goods Movement System

An assessment of the economic structure of the goods movement system was an important task of the study. In order to identify this structure, vital cost and volume data from different industry segments were needed. These data served as a key input into the estimation of the total cost, direct and indirect, of the goods movement system. Private sector costs were estimated and an evaluation of the proportion of the total cost of a finished product that is attributable to goods movement were made. Consideration of the impact of pilferage, waiting time, traffic delay, other cost for business manpower, space, and overtime was incorporated into the analysis.

Questionnaires used both through the mails and during face-to-face interviews were the main source of these data; the apparel questionaire utilized appears on page VII-20. The industry groups and associations, both apparel and trucker, were approached by the staff. From these organizations, names of members who would be helpful were obtained as prospective sources of data. A stratified non-random sample of these members was conducted. More than 100 trucking and apparel firms were interviewed; approximately 80 firms were involved in the production of women's and children's apparel. The TAD survey results as to the number of apparel firm employees and product classification were compared to data furnished by OAIPD. A close correspondence between the two was noted.

Results of the apparel questionnaire were also used to develop estimates of firm production levels. Annual units shipped were related to the number of employees and the average wholesale value via multi-variable linear regression analysis. The results were as follows:

Annual Units Produced = 648,050 - 24,640 (average wholesale value) + 6,650 (number of employees per firm).

Correlation coefficient = .600

The information obtained from the truckers, shippers and receivers has been invaluable. These actors in the complex goods movement network provided the study with their own viewpoint of the system.

The various industry groups and associations have been cooperative in providing access to their members. The level of community, industry and governmental cooperation has been high. This has been a significant factor in the success of the data acquisition phase. The expenditure of time and manpower in this phase of data collection was also high. The effort however did provide a means of quantifying what were previously only opinions and impressionistic evaluations.

VII.5 Environmental Data

The final element of the data acquisition effort was the compilation of air and noise pollution levels. These measurements were made by the Department of Air Resources, Bureau of Technical Services, and the Bureau of Noise Abatement.

The air pollution monitoring was completed in February of 1974. The measurements were performed by the Department of Air Resources Mobile Laboratories. Thirteen (13) different sites within the Garment Center were used. Data were collected on pollutant levels and meteorological conditions (wind speed and directions, temperature, barametric pressure, etc.) The pollutants that were monitored included carbon monoxide, nitrogen dioxide, aldehydes, hydrocarbons, and smokeshade (particulate matter). The thirteen sites used were:

1. 7th Avenue between West 37th Street and West 38th Street.
2. 6th Avenue between West 36th Street and West 37th Street.
3. West 39th Street between 7th Avenue and 8th Avenue.
4. 8th Avenue between West 36th Street and West 37th Street.

5. West 36th Street between 7th Avenue and 8th Avenue.
6. 9th Avenue between West 35th Street and West 36th Street.
7. West 35th Street between 7th Avenue and 8th Avenue
8. West 36th Street between Dyer Avenue and 10th Avenue
9. 10th Avenue at West 37th Street.
10. West 36th Street between Broadway and 7th Avenue.
11. West 38th Street between 7th Avenue and 8th Avenue.
12. West 37th Street between 7th Avenue and 8th Avenue.
13. Broadway at West 38th Street.

This data was supplemented by additional data collected at 8th Avenue between West 41st Street and West 42nd Street. Whenever possible, simultaneous vehicle classification counts were made for at least one day at each site.

In addition to the air pollution measurements that were made, monitoring of noise levels was conducted. Data were collected by making wide-band tape recordings of five minutes duration. These recordings were made from a mobile Bureau of Noise Abatement van. The van has a microphone mounted on the roof and was parked at the curbside at different locations for each recording. The equipment used included a Bruel and Kjaer Model 2204 Precision Sound Level Meter, a Model 4145 Condenser Microphone and a Nagra Model IV-B Tape Recorder. All recordings were made on a linear scale of the sound meter, at a tape speed of 7 1/2 inches per second.

The sampling procedure used on avenues was to tape data at 1 1/2 block intervals, alternating between corner and mid-block locations only. Data were compiled between 10:30 A.M. and 3:00 P.M. At some locations, readings were not taken due to the difficulty of finding a suitable location to stop the van without disturbing traffic flow.

In summary, the development of a data base and the analysis of the data gathered were two major tasks for Phase I of the study. Some traditional planning methods as well as new approaches were utilized to study the complex subject matter of urban goods movement. Thus, such techniques as time-lapse photography, machine counts and manual classification counts, Automatic Traffic Recorder, the development of a microscale and macroscale model of the Garment Center, and the development of certain forms, e.g., Pedestrian and Handcart Observations, were formulated and used towards this goal, i.e., to study and to improve the urban goods movement system.

MANHATTAN GARMENT CENTER
URBAN GOODS MOVEMENT STUDY

Apparel Questionnaire
Manufacturer/Jobber

New York City
Transportation Administration

Manhattan Garment Center
Urban Goods Movement Study

APPAREL COMPANY QUESTIONNAIRE

Interviewer ____________ Date ________ Time ________

Name of Company ____________ Interviewee ____________

Address ____________ Title ____________

____________ Phone # ____________

Years in business at this location

With same name ______ (years)

Under other name ____________ give other name ______ (years)

Classify the business
☐ Manufacturer
☐ Jobber
☐ Contractor
☐ ________ Supplier
☐ ________ Other (specify)

1. Multi-location firm? ☐ Yes ☐ No

Part of another firm? ☐ Yes ☐ No

How Associated? ____________

Address ____________

Number of different phone listings at this location? ________

What are the listings or names used? ____________

2. If multi-location firm, or part of another firm, which functions are performed outside this building location?

Function	Address	Years at Location

3. Circle product classification manufactured or industries served. (If more than one industry, show percent by annual revenue).

	%	(IF APPLICABLE) Time in Days from Cut to Ship	Avg Whse Value Fall	Avg Whse Value Spring
Dresses - Better	___ %		$	
Dresses - Popular	___ %		$	
Dresses - Moderate	___ %		$	
Ladies' Sportswear	___ %		$	
Ladies' Coats and Suits	___ %		$	
Ladies' Rainwear	___ %		$	
Children's Wear	___ %		$	
Other ________	___ %		$	
TOTAL	100%			

List and rank the garments classified as Sportswear

Item	Rank

4. a) Estimate square foot of area occupied in this building by floor for your company.

Floor ____ Area (Sq. Ft.) ________, Floor ____ Area ________, Floor ____ Area ________

b) What is the total monthly rental rate? $________

5. a) Check functions performed at this location. Show floor number if more than one floor is used.

FUNCTION	CHECK if Present at Location	FLOOR if Multifloor Operation
Piece Goods		
Receive	☐	
Inventory (storage)*	☐	
Process Piece Goods (Sponge, dye, etc.)	☐	
Ship Piece Goods	☐	
Cut Piece Goods	☐	
Trim		
Receive	☐	
Inventory (storage)*	☐	
Ship	☐	
Shipping Supplies		
Receive	☐	
Inventory (Storage)*	☐	
Ship	☐	
Cut Goods		
Receive Cut Goods	☐	
Sew Cut Goods	☐	
Ship Cut Goods	☐	
Sewn Goods		
Ship Sewn Goods	☐	
Finished Goods		
Receive	☐	
Inventory (Storage)	☐	} Area
Ship	☐	} Area
Offices	☐	
Showroom	☐	
Sample Making	☐	
Pattern Making	☐	
Other ________	☐	
________	☐	
________	☐	

* Do not check if received immediately before anticipated use.

	Average	1973 Range Low	1973 Range High
b) What is the number of employees at this location? (How many of the employees belong to the ILGWU? ________)			
What is the weekly payroll at this location?	$	$	$
c) What is the number of employees and supervisors in the receiving and shipping departments?			
d) For the employees above, how many hours per week are directly involved in the goods movement on the street, i.e., making pickups and deliveries?			
What is the weekly payroll of the above employees?	$	$	$

6. Normal shipping and receiving hours ________

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7. During the past 5 years, what type of growth has your company experienced?

	Sales Dollars	Units Shipped
a) Negative	☐	☐
b) No change	☐	☐
c) Up to 5% annually	☐	☐
d) 5 - 10% annually	☐	☐
e) 10+% annually	☐	☐

Comment on the basis of the growth or decline.

8. How much pilferage did you encounter during 1973? $__________

To the best of your knowledge, where did the pilferage occur?

On Premise ____%

Elsewhere Within Building ____%

On Street (Not From Truck) ____%

From Parked Truck ____%

During Shipment ____%

Don't Know ____%

TOTAL 100%

When off premise, who suffered the loss?

What are limits of shipment theft insurance coverage and deductable amount?

What effect has the pilferage had in obtaining shipment theft or theft insurance?
(Circle for which answer was given.)

What are the annual shipment theft or theft insurance premiums?
(Circle for which answer was given.)

Name of Company______________________

9. Complete the following blanks for each function that has receiving activity at this location. Receipt activity should agree with question #5. Use additional sheets if required. Sample actual records when possible.

a) Function or item received ________ Physical handling unit when in storage ________

END OF MONTH LEVELS FOR 1973

		MONTHLY AVG.	PEAK MONTH	ANNUAL TOTAL
b) Received (Avg. Whse. Value $________ if not previously given for roll of piece goods)	UNITS or $	________ ________	________ ________ ________ (month)	________ ________
c) Inventoried or Stocked Levels (to be completed for those items not later sold separately as part of business activity)	UNITS or $	________ ________	________ ________ ________ (month)	

d) Other than the peak month above, what are the other high activity months for receiving?

	MONTH	% OF PEAK MONTH ABOVE or UNITS RECEIVED	
Receiving - Same Season	________	________%	________
- Different Season	________	________%	________

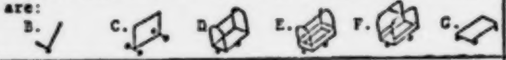
e) What is the estimated weight per material handling unit received?

f) For the items received above, are you charged separately for transportation?

☐ Yes, all the time. Charges for 1973 were $_____ including charges billed separately.

☐ Yes, for _____% of my deliveries, charges for 1973 were $_____ including charges billed separately.

☐ No, none of the time. The transportation cost was included in the price of my received merchandise.

	INTRA BUILDING	INTRA GARMENT CENTER	COMMERCIAL ZONE (free zone)	OTHER
g) Where were the goods shipped from? Indicate % of receipts (deliveries) that originate from each geographical area rather than sales office location visited. Obtain physical shipment origin rather than sales office location.				
h) What is the physical handling unit at receipt? (Use % if more than one based on units. Choices are package goods, bundles, bags, rolls, loose hangers, etc.)				
i) What cart type is used for transporting goods on the street? Choices are: A. Person 				
j) What is the average number of units per cart by cart type?				
k) What is the estimated number of deliveries received?				
Average per week				
Peak per week				
l) Estimate the range of delivery sizes.				
Average size delivery is - units				
Typical small deliveries average - units				
Typical large deliveries average - units				
m) Based on the number of deliveries received, classify the type of delivery.				
COLLECT				
PREPAID				
C.O.D.				
OTHER				
OTHER				
TOTAL	100%	100%	100%	100%

n) What means, by percent usage based on units, are used to transport the receipts from the following sources? Indicate carrier who makes final delivery to you.

		INTRA BUILDING	INTRA GARMENT CENTER	COMMERCIAL ZONE (free zone)	OTHER
PUSH BOYS:	Your Push boys				
	Their Push boys				
	TOTAL	100%	100%	100%	100%
TRUCK:	Your Truck				
	Their Truck				
	TOTAL			100%	100%
CARRIER TYPE: - OVER THE ROAD (line haul)	Common Carrier				
	Contract Carrier (name if possible)				
	Private Carrier (name if possible)				
- OTHER	Local Truckman (name if possible)				
	Freight Forwarder				
	Air Freight Forwarder				
	UPS				
	PP				
	TOTAL			100%	100%

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o) List the addresses of the three apparel or supply firms you receive the most receipts from. Indicate percent of total receipts from each firm either individually or on a total basis for each column.

INTRA BUILDING	INTRA GARMENT CENTER (Building Address)	COMMERCIAL ZONE (Free-Zone) (County or City)	OTHER (State, Region or Country)
______ ___%	______ ___%	______ ___%	______ ___%
______	______	______	______
______ ___%	______ ___%	______ ___%	______ ___%
______	______	______	______
______ ___%	______ ___%	______ ___%	______ ___%
______	______	______	______

(maximum total per column 100%)

Name of Company______________________

10. Complete the following blanks for each function that has shipping activity at this location. Shipping activity should agree with question #5. Use additional sheets if required. Sample actual records when possible.

a) Function or item received ________ Physical handling when in storage________

END OF MONTH LEVELS FOR 1973

		MONTHLY AVG.	PEAK MONTH	ANNUAL TOTAL
b) Shipments (Avg. Whse. Value $________) if not previously given -per roll of piece goods -per shipping carton	UNITS or $	______ ______	______ ______ ______ (month)	______ ______
c) Inventory Levels	UNITS or $	______ ______	______ ______ ______ (month)	

d) Other than the peak month above, what are the other high activity months for shipping?

	MONTH	% OF PEAK MONTH ABOVE	or UNITS SHIPPED
Shipping - Same Season	______	______%	______
-Different Season	______	______%	______

e) For the product sold what is the % of returned units and typical return shipment size?

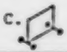
f) What is the estimate weight per material handling unit shipped? (List unit used)

g) For the items shipped above, did you charge separately for transportation?

☐ Yes, all the time.

☐ Yes, for ____% of my shipments. Describe criteria to charge or not charge separately.

☐ No, none of the time. The cost of transportation was included in the price of my shipped merchandise.

	INTRA BUILDING	INTRA GARMENT CENTER	COMMERCIAL ZONE (free zone)	OTHER
h) Where were the goods shipped to? Indicate % of shipments that terminate in each geographical area listed. The indicated area should be the first contact the shipment has with the customer's facility.				
i) What is the physical handling unit at shipment? (Use % if more than one based on units. Choices are package goods, bundles, bags, rolls, loose hangers, etc.)				
j) What cart type is used for transporting goods on the street? Choices are: A., Person B. C.  D E. F. G.				
k) What is the average number of units per cart by cart type?				
l) What is the estimated number of shipments made?				
Average per week				
Peak per week				
m) Estimate the range of the shipment sizes.				
Average size shipment is - units				
Typical small shipment average - units				
Typical large shipment average - units				
n) Based on the number of shipments made, classify the type of shipments.				
COLLECT				
PREPAID				
C.O.D.				
OTHER				
OTHER				
TOTAL	100%	100%	100%	100%

o) What means, by percent usage based on units, are used to transport the shipments initially from your facility?

			INTRA BUILDING	INTRA GARMENT CENTER	COMMERCIAL ZONE (free zone)	OTHER
PUSH BOYS:		Your Push Boys				
		Their Push Boys				
		TOTAL	100%	100%	100%	100%
TRUCK:		Your Truck				
		Their Truck				
		TOTAL			100%	100%
CARRIER TYPE:	- OVER THE ROAD (line haul)	Common Carrier				
		Contract Carrier (name if possible)				
		Private Carrier (name if possible)				
	- OTHER	Local Truckman (name if possible)				
		Freight Forwarder				
		Air Freight Forwarder				
		UPS				
		PP				
		TOTAL			100%	100%

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p) List the addresses of the three apparel, supply companies or distribution centers you make the most shipments to. Indicate percent of shipments to each firm.

	INTRA BUILDING	INTRA GARMENT CENTER (Building Addresses)	COMMERCIAL ZONE (free zone) (County or City)	OTHER (State, Region or Country)
1	________ __%	________ __%	________ __%	________ __%
	________	________	________	________
2	________ __%	________ __%	________ __%	________ __%
	________	________	________	________
3	________ __%	________ __%	________ __%	________ __%
	________	________	________	________

(maximum total per column 100%)

q) What is the length of in-transit time if known?

LOAD ORIGINATION		CHECK HOURS	 DAYS	ACTUAL LOW	 AVERAGE	 HIGH	DESIRABLE
Intra Garment Center		☐	☐	____	____	____	____
Commercial Zone		☐	☐	____	____	____	____
Other	________	☐	☐	____	____	____	____
(list from "o" above)	________	☐	☐	____	____	____	____
	________	☐	☐	____	____	____	____

r) Describe how you obtain freight service. On what basis and how reliable is the response?

What is the range and average length of time for a response?

s) How did you select your trucking company?

11. Describe documentation, paperwork or other means to control flow from administrative point of view. Determine points of "paper" transfer and count verification.

a) For pickups at your facility
-Runner

-At your facility

-Accompanying transfer to other or freight facility

b) For deliveries to your facility
-Accompanying transfer to your facility

-Runner

-At your facility

12. What improvements do you see possible in the goods movement?
-On short term basis?

-On long term basis?

(OPTIONAL - FOR THOSE THAT HAVE MOVED OPERATIONS INTO OR OUT OF GARMENT CENTER)

13. Indicate the reasons for your latest move.

Most Important	Important	Not Applicable	
☐	☐	☐	To obtain space on (higher) (lower) floor
☐	☐	☐	To obtain (more) (less) space
☐	☐	☐	To obtain cheaper space
☐	☐	☐	To consolidate onto single floor
☐	☐	☐	To locate in newer building
☐	☐	☐	To be closer to mass transit
☐	☐	☐	To be closer to freight terminals
☐	☐	☐	Easier to ship and receive at new location
☐	☐	☐	To have safer location for goods and personnel
☐	☐	☐	Previous lease terminated
☐	☐	☐	Better labor availability
☐	☐	☐	Lower labor cost
☐	☐	☐	Accessibility to market
☐	☐	☐	Accessibility to other parts of existing operation
☐	☐	☐	Accessibility to suppliers
☐	☐	☐	Tax advantages

VIII. Implementation Program

The development and implementation of a program consisting of short-range proposals to improve the movement of goods and people has been a principal goal of this study. Since several past studies were unable to implement their recommendations, a strong effort was made to implement several of the less complex proposals of Phase I.

The confidence thus generated will ease the implementation tasks of Phase II, when several significant goods movement improvements will be evaluated.

There were numerous proposals available for consideration. A number of these, e.g., construction of consolidation terminals, were not evaluated since they required high capital investments, major technological advancements, or major structural changes to the industries involved. These were more appropriately considered to be long-range proposals, and as such they will be investigated during Phase II. The analysis focused accordingly on short-range low capital improvements.

As a preliminary step in the evaluation process, a simple screening model was constructed to assess, on a qualitative basis, the various advantages and disadvantages of a particular proposal. A set of systems criteria was developed for use in the preliminary evaluation of these alternatives. Some of the factors, that were believed to affect the desirability of a proposal, were included into the screening model. They were:

- primary objective
- political feasibility
- administrative feasibility
- implementation cost to the private sector
- implementation cost to the public sector
- implementation time
- whether an operational innovation is called for
- applicability to other areas
- major change in the goods movement system
- benefits and costs to the public sector
- benefits and costs to portions of the private sector

The twelve short-range proposals presented for investigation were:

- Passenger Vehicle Ban
- Creation of Turning Lanes
- Restricted Pedestrian Crossings
- New Parking Regulations
- Corner Curb Cuts
- Mid-Block Curb Cuts
- Off-Hour PU&D
- Street Widening
- Special Handcart Lanes on Streets and/or Avenues
- Overnight Off-Street Parking
- No Standing on one Curbline
- Parking Reservation System

The results of this analysis are shown in Table VIII-1. A positive net effect of a given proposal on a specific factor is denoted by a "+", a negative effect by a "-", and an ambiguous effect by "?".

The systems criteria used for their evaluation showed that the off-hour pickup and deliveries (PUD) proposal represented a radical departure from the present methods of receiving and shipping. An off-hour PUD program would require a high degree of participation by all parties involved so that dual operations (night and day) could be avoided. If dual operations were required, the cost of overtime wages to both the trucker, building operator, and manufacturer would be prohibitive. Because of the highly segmented nature of the industries involved, it was felt that off-hour PUD would be difficult to achieve in the short-run. However, due to the importance of this goods delivery method, it will be further investigated in Phase II.

The proposal for the widening of streets was primarily focused on West 35th Street. A street widening program was undertaken on West 36th and West 37th Streets in 1962 and resulted in the creation of an additional moving lane for traffic on each of the two streets. The proposal for the widening of West 35th Street was rejected because of the existence of building and subway vaults under the sidewalk and roadway. The costs of removing or reconstructing these vaults would be high and the building owner would probably

Table VIII-1

SYSTEMS CRITERIA FOR THE EVALUATION OF SHORT-RANGE LOW CAPITAL IMPROVEMENTS

SYSTEMS CRITERIA				ALTERNATIVE											
				Passenger Vehicle Ban	Turning Lanes	Restrict Pedestrian Crossings	New Parking Requlations	Corner Curb Cuts	Mid-Block Curb Cuts	Off-Hour PU&D	Street Widening	Special Handcart Lanes on Streets and/or Avenues	Overnight Off-Street Parking	"No Standing" On One Curbline	Parking Reservation System
APPLICABILITY TO OTHER AREAS				Yes	Yes	Yes	Yes	No	No	Yes	Ltd.	No	No	Yes	Yes
OPERATIONAL INNOVATION				No	No	No	No	No	No	No	No	No	No	No	Yes
INSTITUTIONAL CHANGES				No	No	No	No	No	No	Yes	No	No	Yes	No	Yes
BENEFITS/COSTS	PUBLIC		AIR/NOISE POLLUTION	+	+	0	?	0	0	+	?	0	0	+	?
			STREET MAINTENANCE	+	+	0	?	0	0	0	0	0	0	0	?
			PEDESTRIAN CONFLICTS	+	0	+	0	+	+	+	-	+	0	0	0
			MASS TRANSIT CONFLICTS	+	+	0	0	+	0	+	0	+	0	0	+
	PRIVATE		TRUCKER	+	+	+	?	+	0	+	+	+	+	+	?
			HANDCART PUSHER	+	0	0	0	+	+	0	-	+	0	0	0
			CONSUMER	+	0	0	0	+	0	+	+	+	+	?	+
			SHIPPER	+	0	0	0	+	0	+	+	+	+	?	+
		OTHERS	GARAGE OPERATOR	-	0	0	0	0	0	0	0	0	+	0	0
			BUILDING OPERATOR	0	0	0	0	0	0	-	-	0	0	0	0

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Table VIII-1

SYSTEMS CRITERIA FOR THE EVALUATION OF SHORT-RANGE LOW CAPITAL IMPROVEMENTS

SYSTEMS CRITERIA		ALTERNATIVE											
		Passenger Vehicle Ban	Turning Lanes	Restrict Pedestrian Crossings	New Parking Regulations	Corner Curb Cuts	Mid-Block Curb Cuts	Off-Hour PU&D	Street Widening	Special Handcart Lanes on Streets and/or Avenues	Overnight Off-Street Parking	"No Standing" On One Curbline	Parking Reservation System
OBJECTIVE		Reduce Congestion	Improve Traffic Flow	Expedite Traffic Movement	Expedite Traffic Movement	Reduce Vehicle-Pedestrian Conflict	Reduce Vehicle-Pedestrian Conflict	Reduce Congestion	Improve Traffic Flow	Reduce Vehicle-Pedestrian Conflict	Improve Cargo/Vehicle Security	Expedite Traffic Movement	Increase Utilization Of Curb Space
POLITICAL FEASIBILITY		?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ADMINISTRATIVE FEASIBILITY		?	?	?	Yes	?	Yes	Yes	Yes	?	Yes	Yes	?
IMPLEMENTATION COST	PRIVATE SECTOR	low	low	low	low	low	low	mod	mod	low	mod	low	mod
	PUBLIC SECTOR	low	none	none	none	low	low	low	mod	low	low	none	mod
IMPLEMENTATION TIME (MONTHS)		3 to 6	1 to 3	1 to 3	1 to 3	3 to 6	3 to 6	6 to 12	6 to 12	1 to 3	6 to 12	1 to 3	6 to 12

bear the burden of these costs.

The creation of specially marked handcart lanes on streets and/or avenues was also rejected. Based upon meetings with the industry, it was believed that the dangers to the handcart pushboys posed by moving vehicles would be substantial. Physical barriers preventing intrusion by trucks, taxis, and automobiles into the special lanes could not be provided while maintaining vehicle access to curbs. Serious accidents would therefore occur. Thus, it was decided that the dangers far outweighed the benefits. As a result, these three of the original twelve proposals were rejected from further consideration.

Overnight off-street parking was a desirable proposal from the trucker's point of view. However, there were a number of obstacles to implementation that could not be resolved immediately. Issues to be resolved included responsibility in the event of loss, fees to be charged, the identification of feasible garage locations, and the procurement of enough truckers to economically justify the proposal. Since the industry did express an interest in this proposal, it was incorporated into the Phase II work program for further study and evaluation.

The proposal for permitting standing on only one side of crosstown streets outside the core of the Garment Center was an alternative closely related to the auto-ban proposal. The limitation on standing would create an additional lane of moving traffic. This extra capacity on certain streets would provide space for those automobiles diverted by the auto-ban. However, since the auto-ban will initially affect only two crosstown streets, the need to provide extra capacity by means of a by-pass route was not deemed to be important. Should the auto-ban be expanded to a larger area, this proposal would be reconsidered.

The parking reservation system was seen as a means of insuring that curbspace was efficiently utilized. Issues such as how to set priorities for the allocation of parking spaces, monitor street activity, provide staging areas, and handle emergency vehicles must be addressed before this program can be instituted. As a result, this proposal will be investigated during Phase II.

In summary, of the twelve short-term proposals presented in Table VIII-1 three were rejected (off-hour PU&D, street widening, and special handcart lanes); three were set aside to be studied during Phase II of the study for possible implementation at a later date, (overnight off-street parking, No Standing on one curbline, and the parking reservation system); and six were chosen for implementation. They are:

- Passenger Vehicle Ban
- Creation of Turning Lanes
- Restrictions on Pedestrian Crossings
- Reduction in Truck Parking Durations
- Corner Curb Cuts

- Mid-Block Curb Cuts

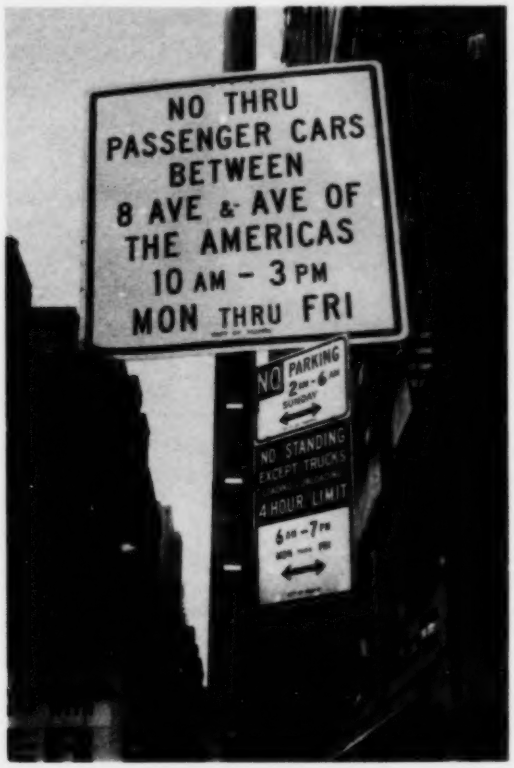
A description of each of these six proposals and the method of implementation follow:

VIII.1 PASSENGER VEHICLE BAN

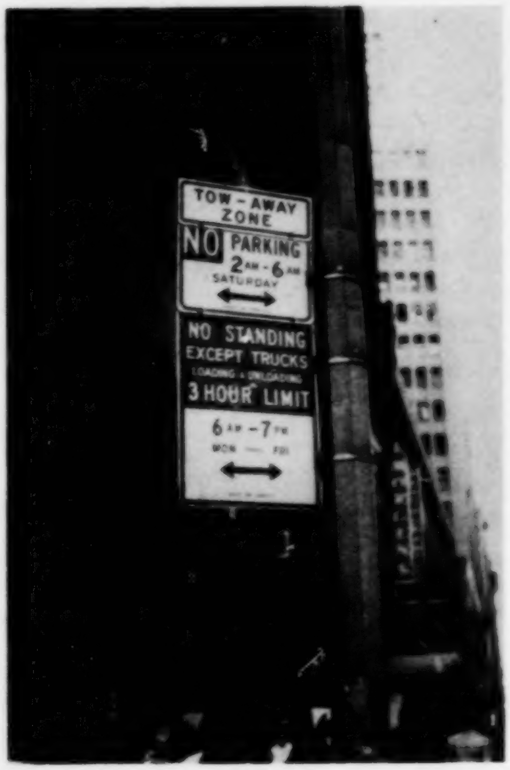
PROPOSAL: A ban on all autos without commercial license plates from 10:00 A.M. to 3:00 P.M. Monday thru Friday on selected streets. Initially, a district-wide ban on automobiles was proposed. Objections raised by various elements of the area's community led to a compromise proposal. The ban was put into effect on only two crosstown streets in the core of the study area. If this initial phase proves to be successful, the auto-ban will be expanded to additional Garment Center streets.

BENEFITS:

- Reduction in street congestion; approximately 66% of the vehicles entering the district are autos, 58% of these do not stop in the area; during the mid-day period, 44% of the vehicles in the Core streets are autos, while on avenues, autos account for only 29% of the total; of the total number of autos, about 5% have commercial plates.
- Increase travel speeds; the average travel speed on the crosstown streets in the Core during the mid-day period is 2.9 m.p.h., while on the avenues it is 6.4 m.p.h.
- Reduction in queues at intersections.
- Improve the air quality to help meet the 8-hour federal CO standards. The auto-ban will improve air quality on the most congested streets. However, it will most likely transfer emissions from the most congested streets to the less polluted avenues. While this should reduce the worst cases of pollution, it may not significantly reduce area-wide emissions.


NO THRU PASSENGER CARS BETWEEN 8 AVE & AVE OF THE AMERICAS 10 AM - 3 PM MON THRU FRI
NO PARKING 2AM-6AM SUNDAY
NO STANDING EXCEPT TRUCKS
4 HOUR LIMIT
6AM-7PM MON FRI

Auto-ban signage


TOW-AWAY ZONE
NO PARKING 2AM-6AM SATURDAY
NO STANDING EXCEPT TRUCKS LOADING & UNLOADING
3 HOUR LIMIT
6AM-7PM MON FRI

Parking restriction signage

Auto-ban street

PHASE I IMPLEMENTATION

The monitoring effort of Phase II will determine whether the auto ban has reduced air pollution in the area or transferred it.

IMPLEMENTATION:

The auto-ban was instituted on two crosstown streets, West 37th and West 38th Streets extending from Sixth to Eighth Avenues, between the hours of 10 A.M. - 3 P.M. Monday through Friday. (See map at the end of chapter VIII. Signs stating "No through passenger vehicles" will permit the designated streets to be used by autos entering and exiting these facilities.

VIII.2 CREATION OF TURNING LANES

PROPOSAL: To ban parking on the street corners at locations where street traffic turns onto avenues. This ban would be 50 to 100 feet in from the intersection and would create an additional turning lane for traffic.

BENEFITS:

- An increase in the number of turning moves possible per signal cycle.
- Intersection could be cleared quicker, thereby reducing the delays due to queues at intersections.
- Facilitate the movement of traffic.

IMPLEMENTATION:

A turning lane was installed at the southeast corner of West 35th Street and 7th Avenue. This site is located in the Core of the district. (See map at the end of chapter VIII.)

VIII.3 RESTRICTION ON PEDESTRIAN CROSSINGS

PROPOSAL: To eliminate pedestrian crosswalks on several avenues, e.g., on the north side of northbound avenues, or on the south side of southbound avenues.

BENEFITS:

- Reduce the delays caused by truck turning movements from crosstown streets.
- Reduce intersection queues.
- Reduce the number of incidents between turning vehicles and handcarts or pedestrians.
- Facilitate the movement of traffic in the crosstown direction.

IMPLEMENTATION:

Due to anticipated enforcement problems this proposal was deferred.

VIII.4 REDUCTION IN TRUCK PARKING DURATIONS

PROPOSAL: Reduce the maximum permitted parking duration in the Core area from four (4) to three (3) hours. Presently, our surveys show that 90% of the trucks stopping in the Garment Center to do business complete their transactions in less than three hours.

BENEFITS:

- Encourage the better utilization of street space.
- Increase the turnover rate of parking spaces (this would result in an increase in the available space-hours for truck parking).
- Encourage the use of trucking stores for the consolidation of shipments.

- Reduce the amount of cruising of trucks by increasing the amount of parking space available.

IMPLEMENTATION:

Necessary changes were made in the posted regulations reducing the maximum allowable truck parking time to three (3) hours. This reduction applies to the area from West 35th to West 41st Streets between Sixth and Eighth Avenues. (see map at the end of Chapter VIII).

VIII.5 CORNER CURB CUTS

PROPOSAL: To provide special paths reserved for the use of handcarts at intersections. This would incorporate the construction of curb cuts at corners, but within the building line.

BENEFITS:

- Reduction in the number of conflicts between handcarts, trucks, and pedestrians at intersections.
- Improvement in the safety of pedestrians due to the elimination of the hazards that result when pedestrians compete with handcarts for the same right-of-way.
- Reduce the delays in handcart travel times due to conflicts at intersections.

IMPLEMENTATION:

Sites chosen for implementation are located at several intersections in the Core area. In addition, several existing curbcuts will be widened to improve accessibility. (see map at the end of chapter VIII for site locations).

Corner curbcut

Left turn lane

PHASE I IMPLEMENTATION

VIII.6 MID BLOCK CURB CUTS

PROPOSAL: To provide additional curb cuts at mid-block locations near driveways and fire hydrants.

BENEFITS:

- Reduce conflicts caused by handcarts at intersections.
- To separate handcart and pedestrian flows until the handcarts are closer to their destinations.
- To facilitate the movement of handcarts on and off the curbs.

IMPLEMENTATION:

The sites selected for implementation are located in no parking areas on West 35th and West 36th Streets between Seventh and Eighth Avenues in the Core of the Garment Center. (see map at the end of chapter VIII for site locations).

VIII.7 IMPLEMENTATION RESULTS

The new traffic and parking regulations were instituted on August 4, 1975. An analysis of the short-run impact of these regulations indicated that hourly volumes in the auto-ban zone, i.e., West 37th and West 38th Streets between Sixth and Eighth Avenues, declined by almost 14 percent during the 10 A.M. - 3 P.M. period. Table VIII-2 depicts the before and after volumes, including the differences, by vehicle type. A 30 percent reduction in passenger vehicles primarily caused this decline in volumes.

As seen in Table VIII-3, travel times initially improved with the imposition of the ban. Mid-September observations,

TABLE VIII - 2

AVERAGE HOURLY VOLUMES 10 AM-3PM

37TH ST. & 38TH ST. BETWEEN 6TH & 8TH AVE.

Vehicle Type	Before 12/74	After 9/16/75	Difference	% Difference
Cars	116	81	-35	-30%
Taxis	69	60	-9	-13%
Trucks	107	111	+4	+4%
Total	292	252	-40	-14%

Source: New York City Department of Traffic

TABLE VIII - 3

AVERAGE TRAVEL RATE 10 AM - 3 PM

6TH TO 8TH AVENUE

LOCATION	Before 12/13/74 (MPH)	After 8/11/75 (MPH)	After 9/15/75 (MPH)
W.36th St.	5.7	4.8(-16%)	11.0(+93%)
W.37th St.	3.1	2.4(-22%)	5.0(+61%)
W.38th St.	4.0	3.8(-5%)	6.6(+65%)
W.39th St.	3.4	4.6(+35%)	6.1(+79%)
Average	4.1	4.0(-2%)	6.8(+67%)

*Note: September and October are the busiest months in the Garment Center

Source: New York City Department of Traffic

however, showed an increase in travel times. Increased seasonal activity may be responsible for this change. The decline in travel speeds may be due to the decreased level of enforcement, a result of New York's fiscal plight. Travel on the non-ban streets increased throughout, partly because of diversions from the auto-ban zone.

Long-term truck parking, in excess of three hours, was initially reduced by nearly 60 percent. By mid-September, the level of long-term parking was almost back to its previous level. The total number of trucks parked also increased, indicative of greater Garment Center activity. Table VIII-4 depicts the distribution of truck parking duration.

The preliminary results are encouraging; expected improvements occurred. The need for enforcement also became clear. Without adequate enforcement, improvements will be greatly hindered. With enforcement, potential benefits can be realized.

TABLE VIII - 4

TRUCK PARKING DURATION 9 AM-5PM

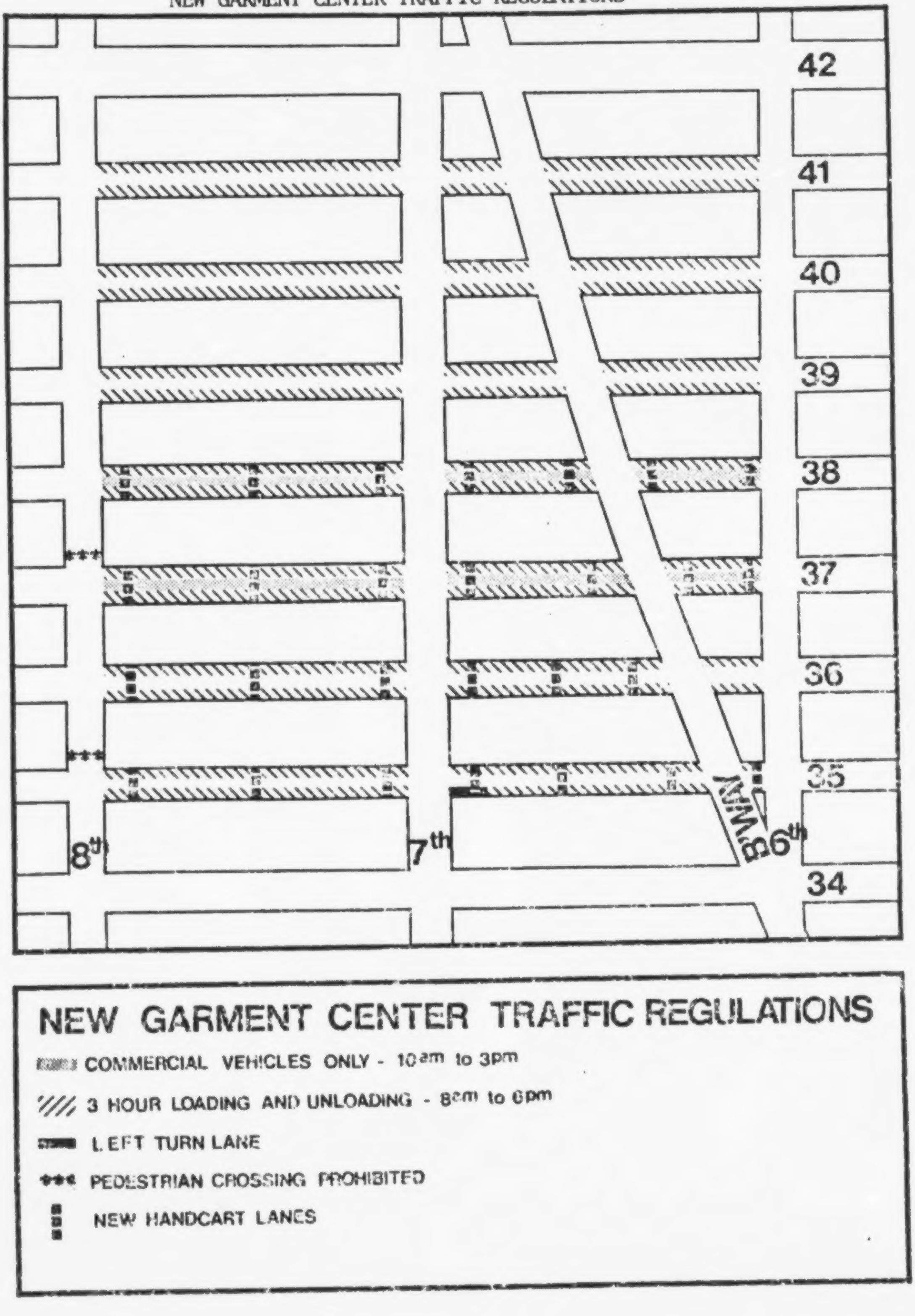
6 SAMPLE CURBSIDES 37TH & 38TH ST, 6TH-8TH AVES

DURATION	BEFORE	AFTER	AFTER
	12/74	8/75	9/75
0-30 min	85 (18%)	104 (27%)	158 (31%)
30-60 min	153 (50%)	123 (59%)	126 (55%)
1 - 2 hrs	128 (77%)	106 (87%)	122 (78%)
2 - 3 hrs	46 (86%)	29 (95%)	45 (87%)
3 - 4 hrs	25 (91%)	16 (99%)	21 (91%)
4+ hrs	41 (100%)	5 (100%)	46 (100%)
Total	478	383	518

Source: New York City Department of Traffic

Figure VIII-1

NEW GARMENT CENTER TRAFFIC REGULATIONS


42
41
40
39
38
37
36
35
34
8th
7th
B'WAY
6th
NEW GARMENT CENTER TRAFFIC REGULATIONS
▨ COMMERCIAL VEHICLES ONLY - 10am to 3pm
//// 3 HOUR LOADING AND UNLOADING - 8am to 6pm
▬ LEFT TURN LANE
*** PEDESTRIAN CROSSING PROHIBITED
▪ NEW HANDCART LANES

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IX. Phase II Program

The second phase of the Garment Center Study will continue certain elements of the Phase I program and initiate several additional areas of investigation. These areas, which are more significant from the goods movement perspective, could not have been undertaken earlier because of the need to establish a data base.

The Phase II Work Program was initiated in January 1976, and is organized into eight tasks.
They are:

Task 1- The Development of Additional Short-Range Alternatives
Task 2- The Development of Long-Range Proposals
Task 3- A Marketing Study of the Garment Center
Task 4- A Transportation Activity Model
Task 5- An Environmental Study
Task 6- The Monitoring of the Implemented Phase I Proposals
Task 7- A Freight Rates (Surcharge) Study
Task 8- Applicability to Other Urban Areas

TASK 1- DEVELOPMENT OF ADDITIONAL SHORT-RANGE ALTERNATIVES

Based upon the experiences of Phase I, additional programs will be developed and implemented. The desirability of these programs will be evaluated using the set of systems criteria developed earlier (Chapter VIII). Among the considerations associated with this evaluation are their political and administrative feasibility, capital cost of a program, and costs and benefits to various elements, particularly the environment, e.g., air and noise. In addition, the impact on mass transit operations (buses), and trucker, shipper and consignee activities will be assessed. Changes in the physical condition of the Garment Center, as a means of facilitating the movement of goods, will also be evaluated. This could include changes in building and street form or function. This task, as well as the entire study, will be conducted in close cooperation with industry, labor, government and local community groups.

The investigation will consider, but not be limited to, the following alternatives:

- Overnight, off-street truck parking
- Storefront consolidation centers
- A parking reservation system
- New cargo security devices
- Truck modifications
- New handcart designs
- Short-run economic incentives, (e.g., road pricing and parking charges).

An analysis of the data base developed in Phase I indicates the possible benefits to be expected from some of these proposals. The expected benefits of a supervised overnight off-street parking facility include:

- Improve cargo security.
- Improve vehicular security.
- The avoidance of extra handling, unloading of trucks in the late afternoon and re-loading in the morning is a common practice to avoid having to park loaded trucks overnight in unsecured locations.
- More flexibility in trucking schedules.
- A reduction in empty vehicle miles.
- Better utilization of existing trucks.
- Revenue for parking facility that would otherwise lay dormant.

An analysis of the macro and micro model developed in this study, see Chapter IV, indicate the following potential benefits of a Parking Reservation System:

- More vehicles would be able to park in reserved spaces that are closer to the shipper's or receiver's location. Thus, there would be a reduction in the distance from the truck to the freight's origin/destination.
- Reduction in the number of vehicles cruising in search of a parking spot.
- Reduce the need to double park because a convenient parking spot was not available.
- Increase space utilization and reduce the total time spent in the Garment Center.

Various schemes for a parking reservation system will be examined. Economic incentives such as simple metering, road pricing, and parking charges, space allocation by trucker or establishment, and long-term vehicle allocation by time of day will be evaluated. Some of the proposals require vehicle owners to anticipate the need for a parking spot, then call and reserve one. The systems envisioned could be manual or computerized. Locations considered will range from portions of a block segment to the entire study area.

TASK 2-DEVELOPMENT OF LONG-RANGE PROPOSALS

The development and evaluation of a number of long-term implementable programs for the improvement of the goods movement system, transportation, and the environmental quality within the Garment Center will be carried out. Consideration of the benefits, long and short-term, and costs will be an integral part of the evaluation procedure. A set of criteria or standards will be used to rate each scheme and the alternatives showing the greatest promise will be chosen for scrutiny. The study shall be primarily concerned with, but not limited to, the conceptual development and evaluation of the following alternatives:

- Containerization.
- Consolidation terminals and storefronts.
- Traffic signal system.

As part of this task, there will be an initial evaluation of the effect a large hanging goods carrier, operating in a manner similar to UPS as a package carrier, would have on the trucker, shipper and consignee activities as well as Garment Center traffic congestion.

Several of these proposals incorporate either operational innovations or new technology in approaching the goods movement process in the area.

Containerization

The possible use of sealed containers (for transportation from shipper to consignee) is a means of reducing counting time, handling and pilferage. Containerization may allow for the introduction of new loading techniques and may serve as an impetus for consolidation.

Consolidated Terminals and Storefronts

An increasing number of small storefront distribution centers has been developed within the Garment Center in recent years. The use of route consolidation and coordination of multiple pickups and deliveries of small shipments has also been increased recently. The truck surveys conducted during Phase I of the study indicate that very few trucks actually pick up or deliver a full truck load at any single stop. The development of a major consolidation terminal or a group of small consolidation centers within the Garment Center to assemble many small shipments into fewer, larger shipments could result in goods being shipped with far fewer vehicles than presently possible. Fewer vehicles for the same volume of goods could lead to a reduction in transportation costs, fuel savings, easing of congestion, and less noise and air pollution. A consolidation terminal could also enable truckers to schedule off-peak deliveries and pickups to avoid daytime congestion.

Consolidated receiving and shipping rooms for individual buildings will also be evaluated. Deliveries could be received and dispatched to consignees throughout the building from a central receiving room. The proposal's principal advantage is that truckers would simply make deliveries to one central location, resulting in substantial savings in their in-building time which, according to our studies, averages about 20 minutes per delivery. In addition to the gain in trucker productivity, elevator usage would be maximized as several deliveries destined for the same consignee could be consolidated into one shipment. The consolidated receiving room would also serve as a buffer during those peak periods when elevator demand exceeds capacity. During those times, the distribution of merchandise within a building can be regulated so that a steady flow of goods is maintained.

Some of the issues to be addressed include: the burden of costs of this operation, the responsibility for security, achieving participation of both trucker and apparel producers, and the effects on trucking rates.

Traffic Signal System

The traffic data assembled during Phase I of the study clearly showed the following: vehicular travel along crosstown streets within the Garment Center was considerably slower than travel along the avenues; a large portion of the delays for travel along crosstown streets was attributed to intersection signal delays. Another area of investigation will be the possibility of revising the traffic signal timing during midday periods at selected intersections or groups of intersections in conjunction with the traffic computer control signal system being considered for Manhattan with the aim of reducing total delays and improving the overall flow of traffic within the District.

TASK 3- A MARKETING STUDY OF THE GARMENT INDUSTRY

A marketing and economic study of the garment industry will be conducted to determine whether the implementation of moderate to high cost, long-range alternatives are viable. This would entail an analysis of the long-range demand for the types of apparel produced in New York City, and factors in the United States and abroad most likely to affect this demand. A general analysis of the apparel industry and its impact on the local economy will be conducted. An examination of the underlying reasons for the industry's continuing migration from the district will also be carried out. An analysis of the effect of these factors upon the city's transportation needs will be made. Manhattan's manufacturing and goods movement activities will be compared to those of other cities to establish similarities and dissimilarities. This may help identify the utlimate effect of congestion on the structure of the industry.

TASK 4- ACTIVITY MODEL

In conjunction with the Marketing Study and utilizing the data base gathered during Phase I in the development of the micro and macro models, the construction of a predictive model of transportation flows (apparel and non-apparel) into and out of the Garment Center will be attempted. The processes that determine how and in what form shipments are generated by economic activity will be emphasized. This would involve the generation and the distribution of activity subject to the interaction of supply and demand forces. The results from this model would facilitate more quantitative assessments of the impacts of different long and short-range alternatives. This transportation demand model will provide inputs e.g., cargo volumes, load characteristics, for an analysis of the impact of different operating and handling schemes.

TASK 5 - ENVIRONMENTAL STUDY

A continued investigation of the environmental conditions in the Garment Center will be conducted. The primary aim will be for a model that will estimate, for a given volume and mix of traffic moving at certain street conditions, the emissions produced. The impact of new environmental regulations, techniques, technologies and proposed changes upon the air quality in the district will continue to be assessed. The environmental study will further develop the evaluation of the public cost of air pollution in the Garment Center. These hidden or non-accountable cost factors are a significant part of the total cost of the goods movement system to the city and their determination will be emphasized.

TASK 6- MONITORING OF THE FIRST YEAR IMPLEMENTATION ALTERNATIVES

Monitoring of the alternatives implemented during Phase I will be conducted. This monitoring task will evaluate compliance and measure the effectiveness of a particular program in improving the goods movement system. Modifications would be made, as required, to increase their effectiveness and alternatives not producing desired effects would be discontinued.

TASK 7- FREIGHT RATES (SURCHARGE) STUDY

A comprehensive freight rate study will be undertaken to measure the incidence and the impact of the interstate rate surcharge on firms doing business in the Garment Center. Factors to be considered include rate structure, estimated volumes, the cost penalty, the justification for the surcharge, and its ultimate effect on the efficiency of the goods movement system, including the impact of its removal.

TASK 8- APPLICABILITY TO OTHER URBAN AREAS

The applicability of the study organization, conduct, methodology, data, evaluation of alternatives and conclusions to other urban manufacturing areas in the United States, and to urban goods movement planning will be assessed.

X Summary and Conclusions

X.1 General Description

The Manhattan Garment Center Urban Goods Movement Study has attempted to examine the problems associated with the movement of goods within a complex urban environment. Several characteristics of the goods movement system in the Garment Center are common to most cities. One of the goals of the study was the development and implementation of various proposals to improve transportation in the study area.

The nature of the apparel industry and its relation to and impact upon the goods movement system had to be ascertained. The apparel industry is engaged in the production of a unique, non-standardized product. Production flexibility is thus essential for the survival of the industry.

The production and marketing of women's and children's wear are the two functions primarily performed within the Garment Center. Most of the apparel employment declines experienced by the area have been in the production end, particularly for the less expensive lines. The designing and marketing functions of the industry have not been as severely affected.

Quick response to customer demands and to changing market conditions is one of the competitive edges that firms located within metropolitan centers have over their mass production rivals. The average apparel firm is small and tends to specialize in just one facet of the garment assembly process. It either sells piece goods or trim and notions, or cuts the fabric and sells the final product or sews the cut fabric into clothing. As a result, there are several inflows and outflows from an establishment in the process of making a garment. Specialization and the need for quick response make goods movement important to the apparel industry.

The area's problems are manifested in the high volumes of vehicles and pedestrians, low travel speeds, and long delivery times. The difficulties experienced by the goods movement system can be ascribed to three major factors. They are: (a) the physical character of the district's streets and buildings, (b) the characteristics of the industry situated in the study area, and (c) the location of the area in Manhattan's Central Business District, CBD.

The physical nature and location of the area are important factors affecting congestion and conflicts in the area. The district serves as a natural conduit for traffic east and west-bound as well as north and south-bound. Also, the lack of adequate shipping and receiving facilities, the preponderance of old buildings, the narrow sidewalks and roadways, and the intensive vertical development all contribute to the area's goods movement difficulties. These elements also limit the type of changes that can be implemented on a short-range basis.

The infrastructure of the Garment Center also contributes to the area's problems. Apparel manufacturing and trucking, the major industries of the area, are fragmented and consist predominately of small firms. The typical apparel firm employs less than 40 workers and has a sales volume of under $5 million. The average trucking firm employs about 60 workers and has a sales volume of approximately $600,000. Over 50 percent have fewer than 5 vehicles. This fragmentation, due to economic necessity, results in the concentration of firms and high density of employment and requires several inflows and outflows in the process of garment assembling. Shipments and receipts are, therefore, small and frequent.

The multiple handling of goods and the high density of employees and firms concentrated in old, high rise buildings without adequate freight facilities means that the area's high levels of activity cannot be easily or effectively handled by the present system.

Data on the volume and patterns of goods movement did not exist and had to be collected by this study. Some of the salient features of goods movement in the area include:

- Approximately 185,000 vehicles traverse the district on a typical day.
- Average speeds are low-about 6 mph on crosstown streets. Mid-day speeds are even lower, 2.9 mph.
- Eighty percent of the time spent in the Garment Center is a result of some form of delay, be it intersection queue, parking and unparking vehicles, double parked vehicles, or pedestrian and handcart conflicts.
- Over 19,000 vehicles park curbside during the day. Forty-five percent of these are intermediate trucks.

- The average parking duration is 1.54 hours. Vehicles were observed loading and/or unloading approximately 30 percent of the time.
- Handcarts, handtrucks and dress racks are the principal modes of moving goods within the study area.
- The average round trip delivery takes over 36 minutes to complete; the round trip distance is about 1/3 of a mile.
- Shipments are of small size and frequent, ranging from three per week for shipping supplies to fifteen per week for trim and notions.
- Total transportation costs of Garment Center firms are 2.7 to 3.9 times higher than the national average for apparel firms.
- Air quality in the area is poor; federally-mandated 8 hour standards were exceeded 83 percent of the time.
- Noise levels in the area are also high.

The conflicts existing in the Garment Center are spatial ones, due in large part to competition between goods, vehicles, and people for the same space. Solutions require either spatial or temporal separation to reduce these conflicts. Spatial separation in the area is difficult to achieve due to the particular physical situation i.e., narrow streets, old buildings, etc. and the high cost associated with physical change. Temporal changes are also difficult to implement due to the operating characteristics of firms i.e., the large number of small firms. A number of the proposed changes could possibly result in higher operating costs. Large scale cooperation, although difficult to realize, is necessary to lower per firm costs of changes that achieve temporal separation and thereby make these changes attractive to the industry.

X.2 Areas of Improvements

An analysis of the goods movement process indicates several areas where potential improvements are possible.

In urban areas, the truck is presently the primary mode of goods distribution. It is anticipated that the truck will continue to be the most commonly used goods carrier due to its relatively low cost and its versatility. The introduction of an urban truck, a vehicle designed specifically for inner city use, will not occur until either trucking firms are sufficiently large to invest in such a financial adventure or the government develops and creates a market for such a vehicle.

Goods are moved within the district mainly by hand-operated vehicles. These vehicles are usually empty on one leg of the pick-up and delivery round trip (see Table IV-2). This problem of deadheading is an area where a firm's management can individually improve efficiency.

As has been shown, competition for parking spaces in close proximity to one's destination is fierce. One result of this search for parking space is that the time and distance traveled between the average truck and its shipping/receiving room is great. This link in the goods movement process is one of the areas in which improvements can be brought about. Proposals that will increase the probability of finding convenient parking spots, such as the parking reservation system and the building consolidated shipping room, should reduce the distance and time spent in delivering goods.

The lack of adequate and protected loading and unloading areas and the dispersal of the transportation firm's customers necessitates that pick-ups and deliveries be made from the truck to the shipper/receiver. While deliveries are made, the truck is idle and occupying curbspace. A successful separation of these two functions, the bringing of goods into the area and their delivery to a particular consignee, would increase the turnover rate and the available curbspace. This separation could be effected by the creation of building consolidated shipping and receiving rooms. Goods destined to a given building could be off-loaded upon the arrival of a truck. Delivery to the consignee would depend upon the availability of elevators and manpower. Potential problems such as liability, safety, large participation of firms and the additional cost of operations must be examined before implementation.

Trucking stores, which are storefront mini-terminals, are presently used to increase the loading rate. Trucking stores handle only the goods of one trucking company as opposed to a building consolidation center, which would handle the shipments of many trucking companies destined to a particular building. The trucking stores are only partially successful in separating the two parts of the delivery process: truck arrival at the curb and within building delivery. Since a trucker can afford only a limited number of stores, the use of these stores can lead to long walking distances between the store and the shipper/receiver.

If there were more flexibility in the industry's structure, it could be expected that a system would evolve whereby certain trucking companies would specialize in particular buildings and offer better services at lower rates. If this were the situation, the existing trucking stores would fulfill many of the functions of a building consolidation center.

Truck surveys conducted during Phase I indicate that very few trucks actually pick-up or deliver a full truck load at any single stop. The development of consolidation centers within the Garment Center to assemble the many small shipments into fewer and larger shipments could result in the use of fewer vehicles than is presently possible.

The energy crisis, the rise in fossil fuel costs, is expected to have some impact on the feasibility of a consolidation terminal. The trucking questionnaire indicated that the average truck consumes 40 gallons per week. At an average price of 60¢ per gallon, the annual fuel bill per vehicle is $1,200. For over-the-road carriers, whose vehicles travel longer distances, the fuel costs are higher. The average number of vehicles per firm is about 8, although about half the firms have fewer than five vehicles. The total fuel bill for the average firm will range upwards of $6,000. It is therefore anticipated that proposals for increasing fuel economy, e.g., increased speeds, reductions in miles traveled, and consolidation centers, will receive the support of the transporation companies.

The rise in energy prices will also increase the cost of products derived from petroleum such as synthetic fibers. This will either raise the operating costs of firms or induce shifts to other products such as cottons. Urban goods movement will be affected to the extent that these products originate in different geographic areas. Wools tend to come from New England, while synthetics come from the South.

Much of the impact of the energy crisis will occur in the long run when institutional and technological changes can occur. Short-run changes such as reductions in miles traveled will not have a major impact because many apparel trucks do not presently travel long distances.

X.3 Institutional Framework

The institutional environment of the Garment Center does much to shape the character of the area and affects any implementation program. The highly fragmented nature of the district's industries, the independent approach of their operators, and the somewhat conflicting interests of the various segments, apparel, labor union, trucker and real estate interests, make cooperation and unified positions difficult. In many instances, problems common to the industry have not been addressed by the industry itself because of the absence of informational exchange.

In conducting a study of the depth and comprehensiveness of the Garment Center effort, these constraints not only have to be recognized, but also dealt with. Community and government interaction and cooperation was necessary in order to successfully complete an undertaking of this magnitude. Cooperation of the various segments of the Garment Center community was obtained via this study's Technical Advisory Group. In fact, this particular study is one of the few efforts where normally competitive industry factions worked together. The committee served as a means of assuring continuous communication between the study staff and the private sector. Compromises in areas of conflict, e.g., proposed auto ban, were developed with information provided at these meetings. The need for community participation in the decision-making process is obvious. Providing a forum in which elements of the community were listened to lengthened the study's time, however it increased their sense of involvement and the probability that the study's recommendations would be implemented.

Based upon this study's experience, it was noted that the private sector is not amenable to long-term capital intensive programs. The long-rang uncertainty in the market and the preponderance of small, financially-strapped firms are among the factors preventing large private sector capital investments. The public sector is the only one able to provide resources for such undertakings. The private sector is, therefore, in favor of short-range, low-capital improvements, whose benefits are immediate.

Governmental interest in the area is multifaceted. The industries of the Garment Center are a sizeable segment of the manufacturing base of the city. They are the traditional employers of the less skilled and low paid. In addition, the area's environmental quality is poor. Air pollution in the district has exceeded National Air Quality Standards at many sites on many days. Short-range improvements provide some respite from the difficulties experienced while developing the cooperative basis upon which future programs, particularly long-term capital intensive ones, can be made.

X.4 Applicability to Other Areas

The analyses, policy recommendations, and experiences of this project are appropriate for a study of urban goods movement in any area, particularly small metropolitan areas. There is, as of yet, no tailor-made methodology on how to conduct a goods movement study; each area will have to proceed on its own with this and other studies serving as general guides. However, various goods movement characteristics observed by this study will probably be experienced to a different degree by other localities. In addition, the issues addressed in the data collection phase and the experiences of the study's committees will be useful to other studies. For example, during the data collection phase, it was necessary to employ time-lapse photography to capture the totality of street activity. Certain factors could not be measured piecemeal because goods movement is an interrelated process. Coordinating the various groups and committees from the private and public sectors was, at times, most frustrating. However, once coordination and cooperation occurred, the possibilities for more effective implementation and commitment materialized. Thus, this study can be instructive to other areas interested in the goods movement system.

Four factors appear to summarize the urban goods flow process: (a) it is a highly interrelated process; (b) the emphasis of the movement of goods is on a rapid provision of customer service; (c) small shipments frequently flow to and from small firms within a compact area; and, (d) vehicles carry loads that are considerably less than capacity. Each of these factors must be addressed in a goods movement study.

Urban goods movement activity is highly interrelated and interactive. Within the Garment Center, the apparel industry affects and is affected by related industries such as trucking. The operations of the area's industries are also affected by the pattern and intensities of through traffic, both vehicular and pedestrian. This intertwining must be considered in the design, data collection, and implementation phases of any future goods movement study. This interrelatedness required interface with the various groups, e.g. the apparel and trucking interests as well as different governmental groups, in order to obtain industry assistance so necessary for the data collection, development and implementation phases. Cooperation and coordination of activities were performed through the three committees described in Chapter II.3. These committees provided a forum where issues important to each group were addressed. This study was exceptionally successful in obtaining the aid of various groups in the private and public sector. The need for cooperation and coordination, however, led to various delays in the study's progress. Strong local support, defined in the broadest sense, is very necessary and was achieved by the study.

To obtain a proper understanding of the goods movement process, many different data collection procedures need to be employed, as was done in this study. Procedures used included traditional engineering techniques such as manual traffic and classification counts and speed and delay methods, as well as questionnaires and time lapse photography.

The questionnaires provided a wealth of information on the characteristics and operations of apparel and trucking firms. Of necessity, the forms utilized were long and somewhat complicated. Although confidentiality was promised, some firms still refused to cooperate. The questionnaires were administered in person rather than by mail. This increased the response rate and the costs too. The cooperation of members of the Technical Advisory Group proved to be instrumental in the successful completion of this element.

Traditional data gathering methodologies tend to focus on just one facet of the goods movement process. In those instances where interactions are numerous and critical, such techniques will invariably miss some of the key variables. Time lapse photography has the advantage of being able to observe this activity in toto. This method was used to measure travel times, identify conflicts, measure delays, enumerate double parking, and time vehicles that were stopped. The cost of such data gathering is relatively low; data analysis costs, however, are high. Also fine detail and extensive coverage is not always feasible.

Although data collection requirements may differ in other localities, certain lessons can be learned from this study's efforts. The data collection efforts of this study were extensive and expensive, particularly the administration of the questionnaire and time-lapse photography. However, the surveys did provide significant insights and data as to the operation of the goods movement process. Cooperation of the local community was instrumental in the data gathering efforts. In addition, some of the surveys developed such as the Duration of In-Building Time form, can be used to discover the existence and magnitude of bottlenecks at key points in the flow process.

The development of a graphic model which indicates the flow patterns and highlights potentially critical points provided a method of integrating some of the relevant interactions in the micro model, Figure IV-2. The model however does not incorporate several additional elements of the goods movement process such as conflicts and speeds. Short of using sophisticated data processing facilities, this type of graphic presentation is appropriate for providing an insight into the goods movement system.

This study's proposals for improving the goods movement process can also be informative to other cities. The proposals address the general problems faced by goods movement- slow speeds, inadequate loading space, small shipment size, and poor air quality. For example, shipments in the study area were observed to be small and frequent. The delivery process typically involves large shipment sizes arriving in over-the-road carriers which are broken down into smaller lots and carried by small trucks or vans to the consignee. This shipment process is typical of other urban goods, such as agricultural goods. The proposed consolidation center can improve the situation within the study area, as well as serve as a model for other areas.

The implementation phase of any study is a critical one. To insure proper evaluation of a study's results, adequate monitoring resources, money and manpower, must be allocated in the initial phase. This project has shown that when the Phase I recommendations were enforced, they were successful, i.e., travel times were reduced. When, as a result of the fiscal crisis, the manpower needed for enforcement and monitoring was unavailable, implementation was extremely difficult and the original gains were lessened. When formulating the data collection, development, and implementation phases, it is important to consider funding.

Within the goals of Phase I (establishing a data base, establishing coordination and cooperation between and among the various apparel and governmental groups and developing and implementing certain low-cost, short-range recommendations), the project was successful.

The success and failures of this study will be instructive to other areas. One facet of this study is different. The proposals of this study are aimed essentially at a specific group of industries operating in a limited area. The general case of goods movement involves many non-related industries operating over a much larger geographic area. Whether proposals should be directed towards specific industries or towards a general area is an issue left for future research.

X.5 Improvement Programs

An effective overall program to improve the goods movement system will require a broad based and comprehensive program including both short and long-range improvement proposals.

On a short-range basis, the study was able to recommend changes that were aimed at the traffic problem. The short-term proposals implemented were:

- Passenger Vehicle Ban
- Creation of Turning Lanes
- Reduction in Truck Parking Durations
- Corner Curb Cuts
- Mid-Block Curb Cuts

The expected benefits of these proposals is a decrease in vehicular delay and congestion, an increase in vehicle speeds, a reduction in pedestrian and handcart conflicts, and an improvement in the area's environment. The advantages of a program aimed at improving the traffic flow are that results can rapidly be realized with a minimum amount of effort. Those improvements, although they may only yield marginal benefits, are still important.

In the near future, basic recommendations concerning methods for improving operational procedures, storefront consolidation and truck modification, as well as better street utilization via a parking reservation system or street metering will be evaluated. The development and introduction of new techniques such as the urban truck are not anticipated to occur within this time frame.

On a long-range basis, large capital investments for new facilities will be required to achieve significant improvements or gains in efficiency. This may also involve modifications to present regulations, documentation procedures, and probably the infrastructure of the industries involved as well.

In the future, planning must recognize the needs of the goods movement process. There must be a better understanding of the present goods movement system within urban areas and its relationship to the environment, other transportation modes and economic growth.

Cities have traditionally been centers of new ideas and development. The small business, with its inefficient but flexible goods movement system, has been the heart of this development process. Enormous investments have been made in buildings located in city centers and in transportation systems serving them. The limitations of the urban goods movement system has been a contributing cause to the recent loss of industry from city centers. This study has been one step in the efforts of government and industry to remove some of these limitations, to more fully utilize existing investments, and to improve the viability of urban centers.

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XII. Glossary

air freight forwarders - companies consolidating and shipping goods by air.

box truck - a handcart, consisting of a box about four feet deep with an overhanging pipe rack, used principally to carry bundles of cut goods and loose materials.

contractor - one who sews the fabric into garments on contract to a jobber. He produces to specification and does not get involved in the designing or marketing aspects of apparel production.

cut goods - fabric that has been cut into the various pieces of the garment.

flat truck - flat cart used to carry piece goods.

freight forwarders - firms that pick-up small shipments, consolidate them into car and truck loads, and ship them to their destinations.

Garment Area Pick-up and Delivery Charge - an additional surcharge established to compensate carriers for the high costs of operating in the Garment Center.

hanging garments - sewn garments being transported on hangers from one place to another.

handcart - the principal means of moving goods to and from vehicles and apparel firms is the handcart.

handcarts, types of - see box truck, pipe racks, flat truck, hand truck.

hand truck - hand-operated vehicle usually used to carry packaged goods.

intermediate truck - also known as a straight job, is a 2-axle 6 wheel vehicle approximately 25 feet long with a maximum gross weight ranging from 10,000 - 40,000 pounds.

jobber - one who performs the same operations as the manufacturer except that the cut materials are sent to contractors to be sewn. Please see manufacturer.

loft - large undivided floor areas in a building. Lofts are the predominant type of structure in the area.

manufacturer - one who buys the raw materials, rolled fabrics, designs the product, cuts the textiles, runs his own sewing operations, and markets the garments produced.

outerwear - outer garments of women's wear consisting of sportswear, dresses of various price range, coats and suits, and children's wear.

over-the-road carriers - companies licensed to carry interstate shipments.

piece goods - large rolls of fabric.

pipe racks - a horizontal bar extended between two upright poles on wheels and used to carry hanging garments.

pushcart - a cart pushed by hand and used to transport apparel goods within the area. Please see handcarts, types of.

specialized carriers - companies limiting their activities to the greater metropolitan region and concentrating on a specific commodity, e.g., apparel.

sportswear - an informal and versatile clothing which is accorded a separate category within women's outerwear, since it does not fit into the traditional definition of the other segments of women's outerwear.

straight jobs - Please see intermediate trucks.

tractor-trailer - 3 or more axle trucks, over 33 feet in length with a maximum gross weight greater than 40,000 pounds. Usually used in the Garment Center to carry piece goods.

trucking stores - ground floor storefronts rented by one or several transportation firms and used as temporary storage facilities.

trucking companies, types of - Please see over-the-road carriers; specialized carriers; freight forwarders; air freight forwarders.

trucks, types of - Please see intermediate truck; tractor-trailers; vans.

urban goods movement - the process of moving goods between suppliers, retailers, and consumers in an urban area.

van - light weight 2 axle four wheel vehicles which are approximately 20 feet long with a maximum gross weight ranging from 5,000 - 10,000 pounds. Often used as service vehicles.